PART 1/6

M/015/072

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Price Field Office
125 South 600 West
Price, Utah 84501

3809
(UTU-73779)
(UT-066)

RECEIVED
NOV 26 1997
DIV. OF OIL, GAS & MINING

NOV 24 1997

Anthony A. Gallegos
Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Dear Sir:

Enclosed are the requested Lone Tree Wedge Gypsum Mine/Plan of Operations environmental assessment and its Decision Record.

Sincerely,

Robert L. Mann

Field Manager

2 Enclosures
1. Plan of Operations EA
2. Decision Record

File Code 3809

DECISION RECORD AND FINDING OF NO SIGNIFICANT IMPACT

EA Log No. UT-066-97-8

Lease or Serial No. UTU-73779

Project Lone Tree Wedge Gypsum Mine/Plan of Operations

Applicant Western Clay Company

Address P.O. Box 127 Aurora, Utah 84620

Project Location T.24S., R.7E., Sections 13, 23, & 24, SLM

County Emery, Utah

BLM Office Price Field Office

Telephone No. 801-636-3600

Decision:

It is our decision to approve Western Clay Company's plan of operations for the expansion of their surface gypsum mine as described in the proposed action of Environmental Assessment No. UT-066-97-8. Exhibit 1 (stipulations) and the monitoring plan shall be made part of the conditions of approval for the plan of operations. A bond in the amount of $76,700 shall be required for reclamation.

Rationale for the Decision:

Western Clay Company requires a source of gypsum in order to supply various buyers. The surface protection measures included in the plan of operations and in the Bureau of Land Management Exhibit 1 are expected to mitigate most of the impacts of the proposed action. The proposed action as approved and mitigated would not result in unnecessary or undue degradation of public land. The only residual impacts would be the loss of a small amount of soil and decrease in the amount of salt in the surface runoff. Short-term impacts include displacement of wild horses from 2,500 acres, loss of vegetation on 25.75 acres, and loss of recreational use on 525.75 acres. There would also be a loss of about 253 Wright fishhook cactus plants, which U. S. Fish and Wildlife Service has determined will not jeopardize the continued existence of the species. Other short-term impacts include some additional emissions of total suspended particles, particulates less than 10 microns in size, sulfur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide, and volatile organic compounds, but the national air quality standards would be met. Up to 13 acres of cryptogamic crust would be disturbed during the next five years and soil stability would be lost until the crust begins to reestablish; total reestablishment of the cryptogamic crust could take 40 to over 200 years. Increased traffic on the county road and the presence of the mine would have an adverse effect on the quality of experience for recreation users in the area. The proposed action is compatible with existing and proposed land use. Approval of the plan of operations is in conformance with the San Rafael Resource Management Plan, which was approved May 24, 1991 and is consistent with other land use plans.

Authority for such action is granted to the Secretary of Interior under the provisions of Title III of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et. seq.) and regulations under 43 Code of Federal Regulations 3809.

Compliance and Monitoring:

The monitoring plan shall become part of the conditions of approval for the plan of operations. The operation shall be checked at least two times a year in compliance with Bureau of Land Management Policy for compliance with the terms and conditions of the approved plan of operations.

Finding of No Significant Impacts:

We have reviewed Environmental Assessment No. UT-066-97-8 which includes the analysis and mitigation of any potentially significant environmental impacts. We have determined that the proposed action selected with the mitigation measures as described in the environmental assessment will not have any significant impacts on the human environment and the San Rafael Resource Management Framework Plan adequately addresses cumulative impacts concerning mining law administration activity. Therefore, an environmental impact statement is not required.

Richard A. Manus

Field Manager

11/20/97

Date

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Price Field Office
125 South 600 West
Price, Utah 84501

3809
(UTU-73779)
(UT-066)

CERTIFIED MAIL--Return Receipt Requested
Certification No. 382 124 898

NOV 20 1997
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NOV 24 1997
DIV OF OIL, GAS & MINING

NOTICE OF DECISION

Mr. Fred Mortensen
Western Clay Company
P.O. Box 127
Aurora, Utah 84620

Your plan of operations concerning the expansion of the Lone Tree Wedge gypsum mine is approved subject to the following terms and conditions which are necessary to prevent unnecessary or undue degradation of public lands and to ensure successful reclamation.

1. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the operator, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The operator shall suspend operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. Any decision as to proper mitigation measures shall be made by the Price Office Manager after consulting with the operator. Western Clay Company shall inform all employees and any contractors that it is illegal to collect cultural artifacts.

2. All disturbed areas shall be restored to the approximate original contour and seeded with the seed mixture described below. The seed mixture shall be planted in the fall of the year (September-November), in the amounts specified in ounces of pure live seed (PLS)/acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will originate from native plant species occurring in southwestern Emery County.

Grasses/Species		Ounces Per Acre (PLS)
Indian ricegrass	Oryzopsis hymenoides	0.02
Galleta grass	Hilaria jamesii	0.01
Shrubs & Forbs/Species		
Torrey Mormon tea	Ephedra torreyana	1.0
Shadscale	Atriplex confertifolia	0.5
Castle Valley clover	Atriplex corrugata	6.6
Rubber Rabbitbrush	Chrysothamnus nauseousus	0.05
	Total	8.18

3. If the seed is broadcast, the ounces per acre in the above seed list shall be increased by 100 percent. Reseeding may be required if a satisfactory stand is not established. The evaluation of the seedings success shall not be made before the completion of the second growing season after the vegetation becomes established. The standard for release of reclaimed acreage shall be to achieve at least 75 percent vegetation density of the plants in the premining area.

4. In order to ensure maximum results with the mitigation proposed by Western Clay Company for the Wright fishhook cactus (Sclerocactus wrightiae), the following shall be added to their procedures.

A. The soil removed from the Sclerocactus wrightiae (seed bed) shall be placed in the low-lying areas or bottoms after the topsoil is replaced in order to concentrate the seed in areas having the greatest chance of seed germination and plant survival.

B. The seedbed removed with each mining phase shall be replace in the area presently being reclaimed in order to reduce storage time. The seedbed from the first area shall be stored in an open air pit made to contain the soil to allow the continuation of natural processes and thereby provide a viable seedbed for final reclamation of the mine site.

C. The cactus to be transplanted shall be dug up, and the roots pruned and treated with a fungicide. The cactus shall be stored with the Bureau of Land Management until the root scars dry. The cactus shall be replanted in the rehabilitated area in the fall. All steps concerning cactus salvage shall be supervised by a qualified botanist approved by the U. S. Fish and Wildlife Service and the Bureau of Land Management.

5. The following measures are conservation recommendations the U. S. Fish and Wildlife Service considers necessary in maintaining the population viability of the Wright fishhook cactus.

A. Western Clay Company shall harvest annually, a minimum of 50 percent of all mature seed from the Wright fishhook cactus (Sclerocactus wrightiae) in the area planned for future quarry operations within the project area. The seed shall be stored with the Bureau of Land Management until it is used as seed for reclamation. Western Clay Company shall use this seed to augment site revegetation during the reclamation of closed quarry areas.

B. A qualified botanist approved by U.S. Fish and Wildlife Service and the Bureau of Land Management shall supervise the revegetation of the project area.

C. The site will be revegetated to accurately reflect the current vegetative community in both species composition and structure.

D. In addition to the Wright fishhook cactus (Sclerocactus wrightiae), Western Clay Company shall use native species from sources in southwestern Emery County, Utah, in revegetating the project site.

6. Western Clay Company shall ensure that all vehicles associated with the quarry project shall remain on existing roads and in the quarry at all times.

7. All hydrologic modifications shall be made in accordance with the "State of Utah Nonpoint Source Management Plan for Hydrologic Modifications-March 1995" unless otherwise authorized by the Bureau of Land Management.

8. Dust-control measures shall be implemented whenever a dust plume behind a moving haul truck attains a length of 200 feet or more and hovers over the road. Measures include but are not limited to watering the road and application of magnesium chloride.

9. Western Clay Company shall comply with all local and state ordinances and regulations.

10. If a reclaimer is used, water mist spray attachments shall be installed and used to control dust caused by and/or emanating from the equipment. Water spray shall be used on stockpiles in other areas from which dust is emanating during mining operations.

11. Cryptogamic crusts shall be stockpiled for no more than two months, if possible. If stockpiles are to remain in place for more than two months, the stockpiles shall be as long and low as possible in order to maximize surface area. Where possible, cryptogamic crusts shall be removed from areas to be mined and applied directly to areas undergoing reclamation, thereby avoiding stockpiling of the crusts.

12. Reclaimed areas shall be fenced and the fence shall remain in place until the reclaimed area is released and the Authorized Officer gives permission for removal.

13. Western Clay Company shall implement the Monitoring Plan as outlined in Appendix C of this environmental assessment.

A reclamation bond shall be required. The proposed bond in the amount of $76,700.00 is acceptable. Since a letter of credit for that amount has been accepted by Utah Division of Oil, Gas and Mining, with both the Utah Division of Oil, Gas and Mining and the Bureau of Land Management being named as beneficiaries, no further action is required concerning the reclamation bond.

Approval of this plan of operations will not now nor in the future serve as a determination of ownership or the validity of any mining claim.

You have the right to appeal to the Utah State Director, Bureau of Land Management, in accordance with 43 Code of Federal Regulations 3809.4. If you exercise this right, your appeal, accompanied by a statement of reasons and any arguments you wish to present which would justify reversal or modification of the decision must be filed in writing with this office within 30 days after the date of this decision. This decision will remain in effect during the appeal unless a written request for a stay is granted.

Richard E. Manus

Field Manager

cc: Bryant Anderson
Emery County Planning and Zoning
P.O. Box 417
Castle Dale, Utah 84513

Kiran Bhayani
Utah Department of Environmental Health
Division of Water Quality
P.O. Box 144870
Salt Lake City, Utah 84114-4870

Tony Gallegos
Division of Oil, Gas, and Mining
1594 West North Temple, Suite 210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

3/6

M/015/072

EA No. UT-066-97-8

UTC-73779

Lone Tree Wedge Gypsum Mine/Plan of Operations

Western Clay Company

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Price Field Office
125 South 600 West
Price, Utah 84501

November, 1997

File Code 3809

ENVIRONMENTAL ASSESSMENT COVER SHEET

EA Log No. UT-006-97-08

Lease or Serial No. UTU-73779

Project Lone Tree Wedge Gypsum Mine/Plan of Operations

Applicant Western Clay Company
P.O. Box 127
Address Aurora, Utah 84620

Project Location T.24S., R.7E., Sections 13, 23, and 24 SLB&M

County Emery, Utah

BLM Office Price Field Office

Telephone No. 801-636-3600

LIST OF PREPARERS

Name	Title	Resources Assigned
Sam Espinoza	Equipment Operator	Hazardous/Solid Wastes
Steve Falk	Mining Engineer	Bond Estimation Review
Kerry Flood	Hydrologist	Air, Climate, Water
Tom Gnojek	Outdoor Rec. Planner	Recreation, Visual, Wilderness
Karl Ivory	Range Conservationist	Grazing, Noxious Weeds
Mike Kaminski	Surface Prot. Specialist	Reclamation, Soils
Wayne Ludington	Wildlife Biologist	T & E, Wildlife
Mark Mackiewicz	Realty Specialist	Lands
Blaine Miller	Archaeologist	Cultural
Tom Rasmussen	Nat. Resource Spec.	Paleontology
Neil Simmons	Geologist	Team Leader

Neil A. Simmons — Team Leader Signature

Geologist — Title

11-19-97 — Date

UT-060-1790-1
July 1986

File Code 3809

STIPULATIONS

EA Log No. UT-066-97-08

Lease or Serial No. UTU-73779

Project Lone Tree Wedge Gypsum Mine/Plan of Operations

Applicant Western Clay Company
P.O. Box 127
Address Aurora, Utah 84620

Project Location T.24S., R.7E., Sections 13, 23, & 24, SLM

County Emery, Utah

BLM Office Price Field Office

Phone No. 801-636-3600

Exhibit 1

The following stipulations have been developed to mitigate adverse environmental impacts which may result from the action permitted by the accompanying decision. The action permitted and its anticipated impacts are fully described in the environmental assessment referenced above.

1. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the operator, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. Any decision as to proper mitigation measures shall be made by the Price Office Manager after consulting with the operator. Western Clay Company shall inform all employees and any contractors that it is illegal to collect cultural artifacts.

2. All disturbed areas shall be restored to the natural appearance and seeded with the seed mixture described below. The seed mixture shall be planted in the fall of the year (September-November) in the amounts specified in ounces of pure live seed (PLS)/acre. There shall be no primary or secondary noxious weed seed in the seed mixture. Seed will originate from native plant species occurring in southwestern Emery County.

Grasses/Species		Ounces Per Acre (PLS)
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Shrubs & Forbs/Species		
Torrey Mormon tea	Ephedra torreyana	1.0
Shadscale	Atriplex confertifolia	0.5
Castle Valley clover	Atriplex corrugata	6.6
Rubber Rabbitbrush	Chrysothamnus nauseousus	0.05
	Total	8.18

3. If the seed is broadcast, the ounces per acre in the above seed list shall be increased by 100 percent. Reseeding may be required if a satisfactory stand is not established. The evaluation of the seedings' success shall not be made before the completion of the second growing season

after the vegetation becomes established. The Authorized Officer is to be notified a minimum of seven days prior to the seeding of the project. The standard for release of reclaimed acreage shall be to achieve at least 75 percent vegetation density of the plants of the premining area.

4. In order to ensure maximum results with the mitigation proposed by Western Clay Company for the Wright fishhook cactus (Sclerocactus wrightiae), the following shall be adhered to in their procedures:

A. The top soil removed from the Sclerocactus wrightiae seedbed shall be placed in the low-lying areas or bottoms in order to concentrate the seed in areas having the greatest chance of seed germination and plant survival.

B. The seedbed removed with each mining phase shall be replaced in the area presently being reclaimed in order to reduce storage time. The seedbed from the first area shall be stored in an open air pit made to contain the soil to allow the continuation of natural processes and thereby provide a viable seedbed for final reclamation of the mine site.

C. The cactus to be transplanted shall be dug up, and the roots pruned and treated with a fungicide. The cactus shall be stored with the Bureau of Land Management until the root scars dry. The cactus shall be replanted in the rehabilitated area in the fall. All steps concerning cactus salvage shall be supervised by a qualified botanist approved by the U.S. Fish and Wildlife Service and the Bureau of Land Management.

5. The following measures are conservation recommendations the U.S. Fish and Wildlife Service considers necessary to maintain the population viability of the Wright fishhook cactus:

A. Western Clay Company shall harvest annually, a minimum of 50 percent of all mature seed from the Wright fishhook cactus (Sclerocactus wrightiae) in the area planned for future quarry operations within the project area. The seed shall be stored with the Bureau of Land Management until it is used as seed for reclamation. Western Clay Company shall use this seed to augment site revegetation during the reclamation of closed quarry areas.

B. A qualified botanist, approved by U.S. Fish and Wildlife Service and the Bureau of Land Management, shall supervise the revegetation of the project area.

C. The site will be revegetated to accurately reflect the current vegetative community in both species composition and structure as described in Appendix A of the EA.

D. In addition to the Wright fishhook cactus (Sclerocactus wrightiae), Western Clay Company shall use native species from sources in southwestern Emery County, Utah, in revegetating the project site.

6. Western Clay Company shall ensure that all vehicles associated with the quarry project shall remain on existing roads and in the quarry at all times.

7. All hydrologic modifications shall be made in accordance with the "State of Utah Nonpoint Source Management Plan for Hydrologic Modifications-March 1995," unless otherwise authorized

by the Bureau of Land Management.

8. Dust-control measures shall be implemented whenever a dust plume behind a moving haul truck attains a length of 200 feet or more and hovers over the road. Measures include, but are not limited to, watering the road and application of magnesium chloride.

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11. Cryptogamic crusts shall be stockpiled for no more than two months. If stockpiles are to remain in place for more than two months, the stockpiles shall be as long and low as possible in order to maximize surface area. Where possible, cryptogamic crust shall be removed from areas to be mined and applied directly to areas undergoing reclamation, thereby avoiding stockpiling of the crusts.

12. Reclaimed areas shall be fenced and the fence shall remain in place until the reclaimed area is released and the Authorized Officer gives permission for removal.

13. Western Clay Company shall implement the Monitoring Plan as outlined in Appendix C of this environmental assessment.

1.0 Introduction

Western Clay Company has applied for and received a road right-of-way grant from the Bureau of Land Management in order to use public land to access, develop, and operate a gypsum mine in the Lone Tree Wedge area of Emery County, Utah. A gypsum mine of 4.95 acres has been disturbed and is actively operating. Western Clay Company's proposed expansion project would involve onsite road improvement, mine expansion, drilling and blasting, and gypsum mining on about an additional 20.8 acres of public land administered by the Bureau of Land Management's Price River/San Rafael Resource Area, Moab District. Gypsum mined from the expanded quarry would be hauled to Western Clay Company's mill in Aurora, Utah. The gypsum would be used to manufacture wallboard and plaster by other companies, sold as an agricultural product, and sold to cement manufacturing plants.

This environmental assessment was prepared in accordance with the National Environmental Policy Act of 1969 and in compliance with all applicable regulations and laws passed subsequently, including Council of Environmental Quality regulations (40 Code of Federal Regulations, Parts 1500-1508), U.S. Department of Interior requirements (Department Manual 516, Environmental Quality), and guidelines listed in the Bureau of Land Management Manual Handbook, H-1790-1. The environmental assessment was developed to assess the environmental impacts of the Proposed Action and reasonable alternatives and will serve to document public participation and the decision-making process.

The Federal action for the proposed development would be the approval of the plan of operations to expand and operate a gypsum mine on Federally administered lands. The analysis in this environmental assessment will guide the implementation of the Proposed Action; however, this document is not the only environmental review upon which authorization is based (see Section 1.3).

1.1 Purpose and Need

Western Clay Company operates a 4.95-acre gypsum mine in the project area, and also operates a grinding and screening mill in Aurora, Utah. The project purpose is to expand the Lone Tree Wedge mine and expand the market for gypsum for use as a soil amendment and for sale to other companies. Western Clay Company has a contract to provide gypsum for the manufacture of wallboard and plaster. In addition, Western Clay Company will be pursuing an opportunity to supply gypsum as Portland Cement Rock to cement companies in the intermountain region where it will be used to produce cement. Western Clay Company has submitted a plan of operations for the expansion of their existing gypsum mine. The plan was submitted pursuant to Title 43 of the Code of Federal Regulations Part 3809.1-4 (1996 edition) for operations which exceed five acres of disturbance.

1.2 Conformance with Land Use Plans

The San Rafael Resource Management Plan was approved on May 24, 1991. The Proposed Action and alternatives would be consistent with the San Rafael Resource Management Plan (RMP) Mining Law Administration management objective "to make public lands available for claim location and development, so long as the scenic values, relict vegetation, and cultural and historic values identified in the RMP goals are protected; to apply RMP goals to mineral development only so long as valid legal rights of claimants are not curtailed..." The proposed mine expansion would be located in an area designated open for development with special conditions when a plan of

operations is required. This environmental assessment is tiered to the RMP. The Resource Management Plan was developed and approved by the Bureau of Land Management after extensive environmental review, including preparation of draft and final environmental impact statements which addressed gypsum potential for gypsum mining within the San Rafael Swell area. Under the Resource Management Plan, an estimated 90 acres of surface disturbance due to mining would be permitted in the year 1998, with 5-acre incremental increases in subsequent years, to a maximum of 240 acres in the year 2027. Currently, there are less than 66 acres disturbed by mining law administration actions, which is less than the 75 acres analyzed by the San Rafael Proposed Resource Management Plan/Final Environmental Impact Statement. Table I shows that over the five year life of the mine, these estimates would not be exceeded in the long-term, although there would be some temporary short-term overruns, such as in the year 2000, when an additional 2.8 acres over and above the estimated 100.0 acres would be disturbed. Thus, the environmental effects of surface disturbance due to mining were adequately analyzed in the environmental impact statement.

Table I

Reasonably Foreseeable Development within the Price River/San Rafael RA Compared with Estimated Disturbance Acreage Analyzed in the Resource Management Plan

Year	Existing (acres)	New (acres)	Released (acres)	Total Est. Disturbance (acres)	RMP Est. Disturbance (acres)
1997	66.00	9.50	--	75.50	85.00
1998	75.50	14.50	--	90.00	90.00
1999	90.00	5.00	--	95.00	95.00
2000	95.0	7.80	--	102.80	100.00
2001	102.80	--	5.00	97.80	105.00
2002	97.8	3.00	8.79	92.01	110.00
2003	92.01	4.00	5.00	91.01	115.00
2004	91.01	4.00	5.00	90.01	120.00
2005	90.01	--	5.00	85.01	125.00
2006	85.01	7.00	6.00	86.01	130.00
2007	86.01	4.00	6.11	83.90	135.00
2008	83.90	3.00	2.00	84.90	140.00
2009	84.90	--	--	84.90	145.00
2010	84.90	4.00	2.00	86.90	150.00
2011	86.90	1.00	2.00	85.90	155.00

2012	85.90	2.00	2.00	85.90	160.00
2013	85.90	--	2.00	83.90	165.00
2014	83.90	4.00	2.00	85.90	170.00
2015	[illegible]	[illegible]	2.00	84.90	175.00
2016	[illegible]	4.00	2.00	86.90	180.00
2017	[illegible]	2.00	4.00	84.90	185.00
2018	84.90	2.00	2.00	84.90	190.00
2019	84.90	2.00	--	86.90	195.00
2020	86.90	4.00	4.00	86.90	200.00
2021	86.90	2.00	--	88.90	205.00
2022	88.90	2.00	1.00	89.90	210.00
2023	89.90	3.00	2.00	90.90	215.00
2024	90.90	2.00	2.00	90.90	220.00
2025	90.90	--	--	90.90	225.00
2026	90.90	2.00	3.00	89.90	230.00
2027	89.90	--	--	89.90	235.00

The draft environmental impact statement was provided for public review in December 1988. The Bureau of Land Management received over 530 letters of response; special management of the San Rafael Swell area was proposed by several commentators. In response to public comment on the draft environmental statement, the Bureau of Land Management prepared additional information concerning the San Rafael Swell and suggested a management direction for the area should a national designation be pursued by local, state, and national representatives and the public. The final management decision (to designate the area as "open to mining with conditions" as stated above) was also based on public input concerning resource conflicts and the mandate to meet national policy of multiple use and sustained yield required by the Federal Land Policy and Management Act. Thus, the potential for mining in this area was analyzed in an environmental impact statement, public scoping was conducted, and public comments were accepted and addressed in a final environmental impact statement prior to approving the Resource Management Plan. Pursuant to the National Environmental Policy Act, the Bureau of Land Management is preparing this environmental assessment for Western Clay Company's proposed project to determine if any significant impacts would occur as a result of the Proposed Action thereby necessitating preparation of a project-specific environmental impact statement.

The project is also in conformance with Emery County zoning regulations which were passed in 1984. In Emery County, all lands outside of town boundaries are zoned for livestock grazing and mining. The proposed action is in conformance with all Federal, state and local land use plans, including the San Rafael Resource Management Plan. The subject land is within the San Rafael Planning Unit and is managed by the Price Area Office, Bureau of Land Management.

1.3 Relationship to Existing Policies, Plans, and Programs

The oversight of exploration and development activities on unpatented mining claims on public lands is an integral part of the Bureau of Land Management locatable mineral program under the authority of the 1872 Mining Law, the Multiple Use Sustained Yield Act of 1960, the Mining and Mineral Policy Act of 1970, and the Federal Land Policy Management Act of 1976. Regulations governing plans of operation are included in 43 CFR 3809. Mitigation approved in this environmental assessment would be incorporated into the plan of operations associated with this project.

The proposed project would comply will all relevant Federal, state, and local laws. Table II lists all authorizing actions required (or possibly required) for project compliance. Western Clay Company has prepared a plan of operations which has been submitted to the Bureau of Land Management and the Utah Department of Natural Resources, Division of Oil, Gas and Mining. The mine expansion would not commence until the plan of operations (including the mining and reclamation plans) has been approved and a surety bond is obtained. The approved plan of operations will include all stipulations described in the environmental assessment as part of the terms and conditions of approval. The proposed mine would be operated in accordance with Mine Safety and Health Administration rules and regulations. Explosive materials would be handled in accordance with the laws and regulations administered by Mine Safety and Health Administration and the Bureau of Alcohol, Tobacco and Firearms.

New roads within the mine area would be authorized as part of the operating plan for the proposed expansion. The project would adhere to management directions specified for locatable mineral development in the San Rafael Resource Management Plan. All new and existing transportation corridors on Bureau of Land Management lands would conform to Bureau of Land Management standards.

Table II
Federal, State, and County Authorizing Actions, Lone Tree Wedge Mine Expansion

Agency	Nature of Action	Authority
Emery County	Approve Mine and Industrial Site Plan	Emery County Planning and Zoning Ordinance
U.S. Army Corps of Engineers	Issue Section 404 Permits, if necessary, for compliance with the Clean Water Act	Section 404, Clean Water Act of 1977, amended 1987 (33 USC Sections 1251-1376)
U.S. Bureau of Land Management, Moab District, Price River/San Rafael Resource Area	Prepare Environmental Assessment Approve Plan of Operations	NEPA; 40 CFR Parts 1500-1508; Federal Land Policy and Management Act of 1976 (as amended); Public Law 94-579 43 CFR 3809

U.S. Environmental Protection Agency	Oversee NEPA and all permitting processes Permit treatment, storage, or disposal of hazardous wastes	See Federal authorities for other agencies Resource Conservation and Recovery Act
U.S. Fish and Wildlife Service	Review impacts on Federally listed or proposed threatened or endangered species of wildlife, plants, and migratory birds	Fish and Wildlife Coordination Act of 1932, as amended 1946, 1958, 1977 (16 USC 661-667e); Endangered Species Act of 1973 (16 USC Sections 1531 et seq.)
Utah Department of Environmental Quality (DEQ), Division of Air Quality	Issue an Approval Order	Utah Clean Air Act (R-307-12-3)
DEQ, Division of Water Quality	Issue Stormwater Discharge Permit Issue Construction Permit for holding pond, if necessary Provide notification of accidental release of hazardous substances into waters of the state	Clean Water Act of 1977, amended 1987 (33 USC Sections 1251-1376)
Utah Department of Natural Resources (DNR), Division of Oil, Gas, and Mining	Approve Notice of Intent to Commence Mining and Plan of Operations	Utah Mined Land Reclamation Act
DNR, Division of Water Rights	Permit to appropriate surface water	Utah Code 1993, Title 73, Chapters 1.0-6.0
Utah Department of Transportation	Issue Oversized/Overweight Permit for haul trucks	Utah Regulations for Legal and Permitted Vehicles
Utah State Historic Preservation Office	Consult with Bureau of Land Management on site eligibility and the effect of the project on eligible sites	Section 106, National Historic Preservation Act of 1966, as amended (16 USC 470)

1.4 Issues and Concerns

The proposed project was scoped internally prior to preparation of this environmental assessment.

The following issues and concerns were identified:

disturbance of critical soils;

impacts to cryptogamic crusts on soils;

threatened or endangered plant species disturbance or habitat loss;

impacts to House Resolution-1500 (HR.1500) lands;

impacts to wild horses;

air quality impacts associated with fugitive dust emissions.

The environmental assessment was released for public review on May 1, 1997. A Notice of Availability was published in local newspapers, advertised on local radio stations, and posted on the electronic bulletin board at the Bureau of Land Management Utah State Office in Salt Lake City. A 30-day comment period ended on May 30, 1997. Four comment letters were received during the comment period; the letters and Bureau of Land Management's responses to comments are presented herein. Portions of the environmental assessment were modified in response to comments.

2.0 Proposed Action and Alternatives

The environmental analysis for the proposed mine expansion includes an assessment of the Proposed Action and the No Action Alternative. Additional alternatives involving other quarry locations were evaluated, but were not considered in detail in this environmental assessment due to environmental reasons. Any other mine locations on the Hebe mining claim group would require more surface disturbance due to additional road building. Since the conditions are similar, the increase in surface disturbance would cause a corresponding increase in environmental impacts.

2.1 Proposed Action

2.11 Overview

The proposed action would be to approve a plan of operations submitted by Western Clay Company pursuant to 43 CFR 3809.1-4 (1996 edition). The proposed operation includes the expansion of a 4.95-acre mine to 25.75 acres, with three additional pits. Additional disturbance over a 5-year period would be 25.75 acres. Current production is 20,000+ tons per year, which could increase to 100,000 tons per year if conditions permit. Access is via road right-of-way UTU-73237 which provides access to a county road and then on to Interstate 70. The right-of-way currently has 3.35 acres disturbed. Upgrading the access road within the right-of-way would cause a total disturbance of 7.15 acres for the road. A road grader will be stationed at the mine for maintenance of the road right-of-way and the county access road. The county road would be upgraded within the current disturbed roadbed when production levels increased over the current production. The proposed mine expansion is located on the Hebe #1, 2, 4, 5, and 8 mining claims, which were located on January 18, 24, 29, and 31, 1996 by Neal Mortensen, Alex Boyter,

Garin Madsen, Fred Mortensen, Jeff McClellan, Wallace Curtis, Brad Boyter, and Eldred Garrick. The proposed expansion would be located in T.24S., R.7E., Section 13, S½S½SW¼, Section 23, N½, and Section 24, N½NW¼, SLM in Emery County, Utah. The existing mine is located in T.24S., R.7E., Section 23, NW¼, SLM. Disturbance at the proposed mine expansion would be 25.75 acres at any one time. This environmental assessment addresses the environmental impacts at the highest anticipated level of production.

Gypsum for the Aurora Plant would be transported 72 miles to Aurora for milling and screening for sale as soil amendments. Gypsum sold to other companies for manufacturing of wallboard and plaster or for Portland Cement Rock would be prepared to company specifications or sold as unprocessed rock.

Access to the quarry would be provided by Interstate 70 (41 miles), an existing Emery County road (29.5 miles), and an existing access road (1.5 miles) operating under an existing right-of-way grant, UTU-73237. The county road would be upgraded as necessary to accommodate increased traffic and rock transportation, but it would not be widened. The access road would be widened and built to Bureau of Land Management specifications.

The primary support facility for the mine is the existing infrastructure at the Aurora Mill. Existing onsite facilities include portable toilets, stormwater runoff-control devices, and a parking area. A portable, diesel-powered crusher and screening system may be installed at the mine if conditions warrant it.

For analysis purposes, it is assumed that successful reclamation will not take more than five years after a disturbed area is recontoured and reseeded. Reclamation should be complete by the year 2013. A reclamation bond will be required which, based on the amount of disturbance, is proposed to be $76,700.

All Federal, state and local laws and regulations, including but not limited to air quality, water quality and solid wastes, would be complied with during the course of the operation of the gypsum mine. For example, the Environmental Protection Agency requires that mines must be able to contain a 10-year, 24-hour event, while the Utah Department of Natural Resources, Division of Water Quality requires the diversion of all upstream waters around the mine and containment of all water from a 100-year event onsite. Both of these agencies' regulations and requirements will be followed, as will those of any other agency.

2.12 Mine Plan

2.12.1 Nature of the Gypsum and Gypsum Reserves

Existing data on the gypsum resources in the project area have been developed from the existing mine and outcrops. The data indicate a quality gypsum resource of approximately 533,960 tons, covering the 25.75-acre project area. The gypsum occurs as two gently dipping beds within the Jurassic Carmel Formation. The upper bed is 8 to 20 feet thick and averages 8 feet, while the lower bed varies from 10 to 17 feet in thickness and averages 10 feet. Thickness of overburden in the project area ranges from 0 to 34 feet, but averages 1 foot.

Areas A and C contain the upper bed, while the lower bed occurs in Area E. Maps for the various mine areas can be found towards the end of the plan of operations in Appendix A. The upper bed is the whiter of the two beds, but contains a high concentration of fluorine and zinc. The lower bed is slightly off color, but is flatter and more uniform than the upper bed. The different beds could very easily supply different markets.

Further exploration would be completed to determine the volume and quality of gypsum in Area E. Western Clay Company would finish mining in Area A, then would move on to Area B, then to Area C-1, then to Area C-2, and finally to Area E going through Area D.

2.12.2 Mining Method

Western Clay Company is currently quarrying the gypsum using conventional drill and blast techniques. Topsoil would be salvaged and segregated in stockpiles for reclamation. Overburden also would be stripped and stockpiled. Initially, an additional six acres would be cleared, exposing enough gypsum to support a year's worth of production. Once the gypsum was blasted, the rock would be either stockpiled or loaded into over-the-road haul trucks by rubber-tired front-end loaders and hauled to Aurora.

The mining sequence of topsoil salvage, overburden stripping, and drilling and blasting would be repeated. Production is expected to increase to 100,000 tons within a year after expansion begins. The mining would then be ongoing. The production would supply the agricultural market, wallboard and plaster manufacturers, and cement plants.

Western Clay Company may elect to use a surface mining machine (reclaimer) in addition to, or possibly to replace, the drilling and blasting process to recover gypsum (see Section 2.12.3). After topsoil and overburden removal, the reclaimer would cut the exposed gypsum beds to a depth of up to 18 inches in a path about 96 inches wide. The cut rock would be loaded into haul trucks and transported to the plant. This type of mining would result in smooth, rounded slopes without benches.

2.12.3 Required Equipment and Facilities

Equipment used in the mining of the gypsum is expected to include the following: reclaimer, backhoe, trackhoe, front-end loader, water truck, bulldozer, road grader, and drill truck. The specific numbers and equipment models would be determined as the mine expansion takes place and production rates stabilize. Bureau of Land Management approval would be obtained for all anticipated equipment substitutions.

The existing equipment and facilities of the Aurora plant would be used to the extent possible to minimize the need for newly constructed work and storage areas in the project area. Facilities at the Aurora plant include: a crushing and screening plant, an office complex, a warehouse, maintenance shop, fuel oil storage and dispensing facilities, and miscellaneous storage areas.

Portable sanitary facilities would be provided. Sanitary waste would be removed from the site and disposed of according to state and local regulations. Routine and preventative maintenance would be performed onsite by Western Clay Company personnel using a service truck. Major

maintenance would usually be performed onsite by Western Clay Company personnel or a contractor.

A diesel-powered surface mining machine or reclaimer may also be used. This machine runs a drum outfitted with teeth along the floor of the mine, thereby breaking up gypsum in a straight line to a depth of about six inches.

2.12.4 Topsoil and Mine Rock Management

Stockpiles for topsoil and overburden would be established onsite. Maps showing the development and reclamation areas and locations of topsoil and overburden stockpiles can be found beginning on page 38 of Appendix A, Plan of Operations. See Section 3.14 for a description of existing topsoil. Any deviation from these locations would be approved by the Bureau of Land Management prior to stockpile relocation. The seedbed stockpile would contain 22 tons of material; cryptogamic stockpiles, 368 tons; and overburden stockpiles, 24,934 tons. The overburden stockpiles would cover an area estimated to be 2.0 to 3.0 acres. The area covered by the other stockpiles would be less than 1 acre.

All topsoil and overburden stockpiles would be protected from erosion, disturbance, and contamination. Actions to minimize wind and water erosion would include stockpile placement within the pit, avoidance of steep slopes, and stabilization of stockpiles with temporary cover crops. Other practices may be implemented, depending on site-specific requirements.

Gypsum stockpiles would continue to be used. Loader operators excavate the gypsum after they blast into stockpiles. Then a loader loads the gypsum from the stockpile into the haul trucks.

2.12.5 Mine-water Discharge and Treatment

Based on current mining experiences, Western Clay Company would not encounter groundwater during mining, so mine dewatering would not be required. Water used for dust suppression along the access and county roads would be applied in small amounts, as needed, to ensure dust emissions are controlled within specified standards, so no runoff would be generated. No mine-water discharge or treatment facilities would be necessary; however, a stormwater pollution-prevention plan would be developed and implemented prior to expansion of the mine to more than 5 acres. The stormwater pollution-prevention plan is required by regulations of the Utah Division of Water Quality (under the Clean Water Act of 1977, as amended) for all gypsum mines which exceed 5 acres in size.

2.12.6 Waste Disposal and Sewage Treatment

All solid wastes would be removed from the mine area and disposed of in a permitted landfill in accordance with state regulations. Portable sanitary facilities would be provided by a local contractor or Western Clay Company. Sanitary waste would be removed from the site and disposed of according to state and local regulations.

The principal use for water onsite would be dust suppression for the surface mining machine and the access road. The surface mining machine could be equipped with a water spray system and would require 200-300 gallons per day. The road would be surfaced with gravel and chemical

suppressants such as magnesium chloride or enzymed-based compounds in order to provide long-term dust abatement. However, during periods of heavy traffic, it would be necessary to use a water truck to reduce dust emissions. The amount of water used would depend on traffic and precipitation, but would be about 200,000 gallons per year (34 acre-feet per year).

Water for dust suppressant is currently being obtained from the Muddy Creek at the Lone Tree Complex at a rate of 2 acre-feet per year. Additional water would be obtained by Western Clay Company from their mill in Sevier Valley or hauled from Huntington by a contractor. The mill is permitted to use water provided by the city of Aurora. Water could be hauled from the Sevier Valley to the Lone Tree Wedge mine two or three times a week.

2.12.8 Fencing

Initially, the mine site would not be fenced. However, whenever any highwalls are created, these areas would then be fenced. Warning signs indicating no admittance to unauthorized personnel would be posted along the access road and around the perimeter of the mine. No gates or cattle guards would be used on the access road. If safety of other public land users, livestock, or wildlife becomes an issue, Western Clay Company would consult with the Bureau of Land Management to determine what, if any, fencing or gates should be used to restrict access to the site. Fencing and/or gates would be provided by Western Clay Company.

2.13 Road Construction

Any new access roads on the mine site would be constructed according to Bureau of Land Management standards as describe in Bureau of Land Management Manual Section 9113. Roads would be built, surfaced, and maintained to provide safe operating conditions at all times as determined by the Bureau of Land Management. The full-surfaced travelway would be 24 feet wide and surface disturbance would be about 44 feet across. Topsoil would be removed during road construction and would be stockpiled.

The access road would cross ephemeral channels at approximately two locations. In addition to the Bureau of Land Management Road Standards Manual, best management practices specified in the State of Utah Nonpoint Source Management Plan of Hydrologic Modification would be implemented, as appropriate. Western Clay Company would install a 36-inch-diameter culvert in the first crossing and would construct a low-water crossing in Area D.

2.14 Employment and Employee Access

Currently, there are four employees working at the mine, as well as three truck drivers. At full production, there would be six to eight employees working at the mine and five to six truck drivers. All of the employees are from the mill in Aurora. Administrative work is being done by the staff in Aurora and would continue to be done by them. Blasting is performed by a combination of Western Clay Company employees and outside contractors. Gypsum loading is done by Western Clay Company employees, while transportation is done by contract haulers under Western Clay Company's supervision.

Employee access would be via Interstate 70, the county road, and the access road using pickup trucks.

2.15 Traffic

The number of haul-truck trips per day would range from six at the 20,000+ tons per year production level to ten at the 100,000 tons per year production level. Transportation of quarry employees to and from the mine would require three to four round trips per day in pickup trucks.

2.16 Hazardous Materials

Hazardous materials are those chemicals listed in the U.S. Environmental Protection Agency's Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act, while extremely hazardous materials are those defined in 40 Code of Federal Regulations 355. Hazardous materials anticipated to be used or stored onsite includes the following: Coolant/antifreeze; fuels such as gasoline and diesel fuel; lubricants such as grease, motor oil, rock drill oil, and gear lubricant; and blasting agents such as dynamite, prell, safety fuses, and detonators. Western Clay Company and any contractors would comply with all Federal laws and regulations regarding hazardous materials. Any release of hazardous substances in the form of leaks or spills in excess of the reportable quantity established by 40 CFR, Part 117, would be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended. If the release of a hazardous substance in a reportable quantity occurs, a report would be furnished to Bureau of Land Management's Authorized Officer. Western Clay Company has prepared a Spill Prevention Control and Countermeasure Plan which is kept onsite during working hours. Because of adherence to the regulations, no unacceptable adverse impacts would be likely to occur due to hazardous materials.

2.17 Life-of-Project

The life-of-project is expected to be five years, with final reclamation being completed in the year 2001.

2.18 Reclamation

2.18.1 Objective

Reclamation would be conducted on all disturbed areas in compliance with Bureau of Land Management and Utah Division of Oil, Gas and Mining standards. The goals of reclamation would be:

to stabilize disturbed areas to prevent erosion and sedimentation on both a short- and long-term basis;

to reestablish self-sustaining vegetation communities and wildlife habitat consistent with predevelopment conditions and the proposed postmining land use;

to restore vegetative productivity to meet or exceed predisturbance levels, and

to reestablish cryptogamic crusts.

2.18.2 Reclamation Schedule

Reclamation would occur in phases throughout the life of the mine. Interim reclamation would be performed after specific areas are mined-out. All areas where reclamation is feasible and practical would be reclaimed as soon as possible after mining has progressed to new areas as described in the plan of operations. Final reclamation would occur upon closure of mining operations, all facilities would be removed, and all remaining disturbed areas would be reclaimed.

During operations, topsoil stockpiles would be temporarily reclaimed (seeded and mulched or otherwise stabilized to prevent soil loss). Because disturbed areas that are no longer needed for operations would be permanently reclaimed, no other temporary reclamation is proposed.

Table III shows the development and reclamation scheduled for the proposed mine expansion. For example, in the year 1997, 9.95 acres would be disturbed for the mine, which includes 4.95 acres of disturbance for the existing mine and 5 additional acres; the total area disturbed would be 9.95 acres; of which 1.64 acres would be reclaimed; no acres would be released; and the total existing disturbance would also be 9.95 acres. The total disturbed area column is cumulative disturbance. It is assumed that reclamation would be complete and released five years after the reclamation was done. The existing disturbance column is the acreage which is disturbed in any given year and has had any reclaimed acreage which is released in a given year subtracted from the disturbed acreage. Acreage which has been reclaimed but has not been released is still considered to be part of the disturbed area and would treated as such. In the year 2002, the 1.64 acres reclaimed in the year 1997 would be released so that existing disturbance would be 24.11 acres, but cumulative disturbance would be 25.75 acres. Final reclamation would be performed in the year 2002, but it would not be released until 2007. Release of reclaimed areas could occur in less than five years if conditions warrant it.

Table III
Development/Reclamation Schedule

Year	New Mine (acres)	Total Disturbed Area (acres)	New Reclaim Area (acres)	Released Reclaim Area (acres)	Existing Disturbed Area (acres)
1997	9.95	9.95	1.64		9.95
1998	5.00	14.95	5.00		14.95
1999	5.00	19.95	5.00		19.95
2000	5.80	25.75	5.00		25.75
2001			5.00		25.75
2002			4.11	1.64	24.11
2003				5.00	19.11

2004			0.0	5.00	14.11
2005			6.08	5.00	9.11
2006			8.17	5.00	4.11
2007			0.0	4.11	0.00

2.18.3 Cryptogamic Crust and Topsoil Salvage Plan

Cryptogamic crust material would be salvaged from areas to be disturbed. Although cryptogamic crusts occur as a thin (0.25-1.00 inch) layer at the soil surface, it is difficult to salvage less than about two inches of material using conventional construction equipment. Therefore, scraper operators would be instructed to salvage crusts using utmost care to scrape only the surface two inches to minimize the amount of soil that is mixed with the crusts.

Topsoil is superior to subsoils or spoils as a plant growth medium and would be used wherever possible. Topsoil typically contains higher organic matter and structural components that promote water infiltration and storage. Although topsoil in the mine area is generally of poor quality, it will support plant species that are tolerant of drought and gypsiferous conditions.

Because soils are thin and horizonation is very weak, all soils would be salvaged for use during reclamation. Most disturbance would take place in soils that are no more than 12 inches deep. If deep soils are encountered, the top 16 inches would be salvaged and stockpiled with the topsoil to supplement the amount of material available for use during reclamation. Soil from 16 inches to bedrock would be salvaged and stored as subsoil. The top 2 inches of topsoil around a 1-meter area for each Sclerocactus wrightiae would be saved and also stockpiled separately. The locations for the stockpiles are shown in maps found at the end of Appendix A. These applicant-committed procedures are also included in the U.S. Fish and Wildlife Service's Biological Opinion found in Appendix D.

During initial mining, cryptogamic crusts would be salvaged and temporarily stockpiled for all areas to be disturbed. Separate lifts of topsoil and subsoil would then be salvaged and stockpiled. Overburden would then be stripped and stockpiled.

As mining progresses, reclamation of mined-out areas would occur as soon as the area is no longer needed for operations. Cryptogamic crusts, topsoil, and cactus soils would be backhauled directly to reclaim areas. If additional material is needed to complete reclamation, it would be taken from the overburden stockpile. If it is not possible to haul directly from the expansion area to reclaim areas, crusts, topsoil, and cactus soils would be stockpiled separately and reclamation would be completed within 1-2 months of the salvage date.

2.18.4 Recontouring and Regrading

All disturbed areas would be regraded to blend with the surrounding topography. Natural drainage patterns would be restored and channels reconstructed to facilitate normal surface runoff and prevent gully formation. All slopes in disturbed areas, including the mine pit, would be contoured to 3:1 (horizontal:vertical) or less.

2.18.5 Revegetation Plan

Moisture and gypsum in the soil would be the primary factors limiting plant establishment on all reclaimed areas. Research has shown that the potential for revegetation success is low in areas receiving less than 8 inches of annual precipitation. However, use of adapted native species and timing revegetation to take advantage of peak precipitation would greatly enhance the potential for seed germination and seedling survival. Procedures that promote moisture capture and infiltration into soils are incorporated into the revegetation plan and would be used wherever possible to facilitate plan establishment.

Soil salinity caused by high gypsum concentrations inhibits plant growth. Salinity causes an increase in the soil osmotic pressure, thereby impeding water uptake by plants. When soils are dry, salts can extract water from plant cells via osmosis. In areas where water is limited, the presence of saline soils exaggerates the lack of water available to plants. Revegetation with salt-tolerant species would help establish vascular plants; the cryptogamic crusts prefer gypsiferous soils.

2.18.51 Seedbed Preparation

2.18.51.1 Soil Replacement and Tilling Procedures

Subsoil or nongypsum waste rock would be used, wherever possible, to bury gypsiferous spoils prior to topsoil replacement. Waste rock or subsoil surfaces would be left rough to promote cohesion between subsurface materials and topsoil. If the area to be revegetated has been compacted, waste rock or subsoil would be ripped to a depth of 12 inches. Ripping loosens compacted soils, thereby promoting infiltration and providing a pervious medium for plant establishment. Ripping would be conducted along contours, where possible, to minimize potential for water erosion. Slopes that are too steep to safely operate equipment along the contour would not be ripped, but would be disced along the slope.

Ripping, while loosening soils, tends to mix deeper material with surficial materials. Due to the potential to bring gypsum to the surface, ripping would be limited only to compacted areas. In noncompacted areas, topsoil would be spread directly on subsurface materials. Wherever possible, a minimum of 8 inches of topsoil or suitable plant growth material would be placed on all surfaces to be revegetated. A thin layer (1-2 inches) of cryptogamic crustal material would then be spread over the topsoil where appropriate. The 2 inches of cactus soil would be spread in areas devoid of cryptogamic crustal material.

2.18.51.2 Soil Amendments

As fertilizers have a detrimental effect on saltbushes and most cactus, no fertilizers would be used.

2.18.51.3 Surface Manipulations

Surface manipulations that trap water, such as pitting would greatly improve shrub establishment on reclaimed areas. After topsoil is spread, but prior to spreading cryptogamic crustal material, surfaces would be disced or harrowed to break up large soil clumps. Discing and harrowing

would be done along the contour where feasible. Tilled soil surfaces would be left uneven to promote water catchment and infiltration. Rough surfaces are also less susceptible to wind and water erosion.

The soil surface would then be pitted. A variety of techniques are available for pitting, but the overall objective would be to create small depressions to capture water. A commonly used method is construction of pits that are 3 inches long, 3 inches wide, and 8 inches deep, approximately 2 feet apart in an alternating pattern on the prepared seedbed. Alternatively, a sheep's foot implement could be used to create small pits. The pitting method used would be decided based on site-specific circumstances, equipment availability, or other considerations.

2.18.52 Seed Mixtures and Seeding Methods.

Western Clay Company would use a seed mixture recommended by the Bureau of Land Management which contains native species that are well-adapted to the range of precipitation and elevation in the region and would help stabilized disturbed areas and support postmining land uses. The selected species are easily established via direct seeding, have good seedling growth rates, are good competitors, have high tolerance for saline soils, and are drought tolerant. Any proposed changes to the seed mixture would be approved by the Bureau of Land Management prior to seeding.

The seed mixture would not contain weed seed. If commercial seeds are used, the seed would be certified, and seed viability would be tested within nine months prior to the planting date. Seed mixture containers would be labeled in accordance with state laws and available for inspection by authorized personnel. If locally collected native seeds are used, they would be collected from plants that are adapted to similar conditions such as soil, aspect, adjacent plant communities of the area to be revegetated.

Seeding would occur in the fall, whenever possible, after September 15 at a time when soils are not wet or frozen. Fall planting would promote germination and seedling establishment by enabling seeds to take advantage of late fall/early winter precipitation. If possible, seeding would occur within two weeks of seedbed preparation to minimize erosion of exposed soils. If it is not feasible to seed prepared areas within two weeks, erosion-prevention measures such as plowing soils into windrows oriented perpendicular to the contour or prevailing winds, berming the downhill side of exposed slopes, or roughening surfaces would be implemented to prevent rill development and reduce soil movement.

Broadcast seeding would be used for the following reasons:

Prepared surfaces may be left uneven for broadcast seeding. Moisture entrapment and storage are of vital importance in this area, and roughened, pitted surfaces would better promote seedling establishment compared with smoothed surfaces required for drill seeding.

Broadcast seeding, followed by raking or chaining to cover seeds, distributes seeds to a wide range of depths in the soil. This ensures that some seed would be sown at the optimum germination depth.

Broadcast seeding must be used on steep slopes where it would be unsafe to operate a range drill along the contour.

The seed mixture would be broadcast over rough surfaces at the rate recommended by the Bureau of Land Management. Broadcast seeds work downward into the freshly tilled soil, and during rainstorms, rain washes seeds into pits where they are covered with a thin layer of soil. If Western Clay Company elects not to pit surfaces prior to seeding, newly seeded areas would be raked with a chain or harrow to cover the seeds.

2.18.53 Mulching

Because cryptogamic crusts require light to develop and survive, mulches would not be used.

2.18.54 Postseeding Maintenance

The objectives of postseeding protection and maintenance are to ensure that newly seeded areas are not disturbed during cryptogamic crust development or during critical periods of seedling establishment. Western Clay Company would be responsible, in coordination with the Bureau of Land Management, for implementing all postseeding protection and maintenance measures. Because the mine area is typically open range, Western Clay Company would coordinate with Bureau of Land Management to restrict wild horses and livestock from these sites.

Signs would be erected adjacent to newly seeded areas to minimize intrusions by off-road vehicle traffic. During final reclamation of the access road, boulders or other natural barriers would be placed across the reclaimed road at selected points and berms would be constructed where needed to discourage off-road vehicle use.

Weed control may be necessary if any of the weeds listed in Table IV become a problem on reclaimed sites. Typically, weeds would be pulled out by hand; however, if infestation becomes too large to hand weed, the Bureau of Land Management would be consulted and another appropriate method would be used.

Table IV
Utah-listed Noxious Weeds

Common Name	Scientific Name
Whitetop	*Cardaria draba*
Musk Thistle	*Cardus nutans*
Diffuse knapweed	*Centaurea diffusa*
Spotted knapweed	*Centaurea maculosa*
Russian knapweed	*Centaurea repens*
Yellow starthistle	*Centaurea solstitialis*

Squarrosa knapweed	*Centaurea virgata*
Canada thistle	*Cirsium arvense*
Field bindweed	*Convolvulus arvensis*
Leafy spurge	*Euphorbia esula*
Black henbane	*Hyocyamus niger*
Dyer's woad	*Isatis tinctoria*
Tall whitetop	*Lepidium latifolium*
Dalmation toadflax	*Linaria genistifolia*
Purple loosestrife	*Lythrum salicaria*
Scotch thistle	*Onopordum acanthium*
Medusahead	*"Taeniatherum caput-medusae"*

2.19 Fire Suppression

The project area is within a conditional suppression area, which means that cost of fire suppression is compared to the resource loss that would occur without suppression. Western Clay Company employees and contractors would be responsible for preventing fires by adequately maintaining equipment used onsite, properly disposing of smoking materials, etc. All vehicles and equipment are and would be equipped with fire extinguishers. If a fire is started or observed, local fire-fighting authorities would be notified immediately.

2.11.0 Applicant-committed Practices

The following is a brief description of various environmental applicant-committed practices that would be implemented under the Proposed Action. These applicant-committed practices are included in the plan of operations, which can be found in Appendix A. In addition to the practices described below, all project activities would conform with Bureau of Land Management operating procedures unless other actions are necessary and approved by the Authorized Officer. All mitigation measures described in this section and in Chapter 4.0 would become a part of the approval of the plan of operations.

1. A Class II cultural resources survey, funded by Western Clay Company, was conducted in Sections 13, 23, and 24, T.24S., R.7E., for the proposed expansion area. Western Clay Company and its contractors would inform their employees of the relevant Federal regulations intended to protect cultural resources. Equipment operators would be informed that if a site is uncovered during operations, activities in the vicinity would immediately cease and the Bureau of Land Management's Authorized Officer would be notified.

2. Surveys for threatened or endangered and special-status animals and plants were completed on October 3, 1996. Several populations of Wright fishhook cactus were found

within the project area. An estimated 316 individual cactus would be impacted by mining the gypsum. Formal consultation was initiated by Bureau of Land Management with the U.S. Fish and Wildlife Service in January 1997 and Western Clay Company is committed to the following mitigation measure:

The 1,000 Wright fishhook cactus would be collected and replanted during reclamation.

Soil within 1 meter of each Wright fishhook cactus plant to be collected would be removed to a depth of 2 inches and stockpiled to be used for a seedbed during reclamation.

Vehicle users associated with the mine site area would be instructed to remain on existing roads and within the mine at all times.

Signs have been posted to advise all motorists to remain on existing roads.

No other threatened or endangered plant species and no threatened or endangered wildlife species were found. If, during exploration, construction, or mining operations, any individual(s) of such animal or plant species or their habitats are found, recommendations for avoidance or mitigation would be made, or, if necessary, a Section 7 would be initiated with the U.S. Fish and Wildlife Service by the Bureau of Land Management.

3. A survey for soils was conducted during August 27-28, 1996. Cryptogamic crusts were found to be prevalent in the area. These cryptogamic crusts cover about 50 percent of the project area. Cryptogamic crusts would be salvaged separately from the topsoil and, where possible, directly backhauled to reclaim areas. If direct backhaul is not possible, cryptogamic crusts salvaged for use during reclamation would be stockpiled for no longer than two months to prevent mortality of crustal organisms. Some crusts may be lost during periods when mine development or expansion is occurring more rapidly than reclamation. To facilitate successful reclamation, Western Clay Company is committed to preserving as much crustal material as practicable.

4. Critical soils - Western Clay Company would implement stringent erosion-control measures to minimize soil loss due to wind and water erosion. Erosion-control measures would include:

minimizing disturbance;

avoiding steep slopes, where feasible;

using best management practices on all construction sites;

constructing roads to Bureau of Land Management specifications, which includes installation of culverts and roadside ditches to control surface water flows;

design and placement of erosion-control devices such as straw bales, rock-check dams, waterbars, silt fences, netting, and berms to slow and/or divert water flow

to reduce soil loss; and

revegetation of all disturbed areas as described in the reclamation plan.

5. Removal or disturbance of vegetation would be minimized through construction site management, such as utilizing previously disturbed areas, designating limited equipment/-materials storage areas, and avoiding areas where disturbance is not necessary until such time as the mine plan progresses into these areas.

6. Reclamation and revegetation of areas disturbed during exploration and construction, but not required for operations, would be initiated in the first appropriate season following completion of construction using methods described in the reclamation plan.

7. Disturbed areas would be monitored for weeds listed in Table IV; if any of these species are discovered in or adjacent to disturbance areas, Western Clay Company would implement mechanical weed control measures such as hand-pulling or plowing. In the unlikely event of a large infestation, the Bureau of Land Management would be consulted and more aggressive weed-control measures, including herbicides may be applied, under the Bureau of Land Management's supervision.

8. Measures employed at all stream crossings to minimized adverse environmental impacts and ensure long-term road stability would include the following:

Construction across all channels would occur during periods of low or no flow;

If a storm occurs during construction, activities would cease until channel flow has subsided;

Channels would be crossed perpendicular to flow, where possible;

Streams and washes disturbed during road construction and/or mining would be restored to preconstruction conditions;

Recontouring and revegetation with appropriate species would be used to aid in bank stabilization;

Netting or other erosion-control devices would be used to minimize erosion until banks are restored to preconstruction conditions;

Culverts would be used for crossing steep, incised channels;

Culverts would be designed according to Bureau of Land Management standards, being able to pass a 10-year flood without development of static head at the culvert entrance and to avoid velocity damage from a 25-year flood and sized for full bankflow for main channels. Overflow conduits would be installed as needed.

9. Temporary erosion-control measures such as mulch, jute netting, sediment traps, or other appropriate methods would be used on unstable soils and steep slopes to minimize erosion until vegetation becomes established.

10. Water for dust suppression along the access road would be done on an "as needed" basis to minimize dust emissions and reduce possible safety hazards caused by dust plumes behind haul trucks. Dust emissions from the crusher/screening system would be suppressed using a fogging system that continuously sprays a light mist over the crushed rock. The surface mining machine would be equipped with a water spraying system. Fugitive dust emissions would be maintained at 20 percent or less opacity (visibility through the air) during construction and 20 percent or less opacity along roads during operations. Adherence to these standards would be evaluated periodically as described in Appendix A. Other measures taken by Western Clay Company to minimize fugitive dust impacts would include, but are not necessarily limited to:

minimizing disturbance;

restricting vehicle speeds in and around the mine;

prompt revegetation of disturbed areas;

restricting vehicles to roads developed for mine operations, except in emergency situations;

covering loaded haul trucks to minimize loss of material to wind and spillage;

implementing dust suppression measures during drilling, blasting, and stockpiling;

restricting areas to be blasted at any one time; and

using dust-control techniques on all stockpiles.

Western Clay Company would implement these or other methods as necessary to maintain compliance with Utah Division of Air Quality Rule No. R307-12. Adherence to air quality standards would be a binding part of approval of the plan of operations.

11. All combustion engines would be maintained in good working order to minimize hydrocarbon and other gaseous emissions and to prevent oil leaks. Engines would be properly muffled to minimize excess noise.

2.2 No Action Alternative

The result of this action would be to not approve the plan of operations. The gypsum mine could continue to operate as long as no more than 5 acres, including reclaimed but not released acreage, were disturbed at any one time. Western Clay Company would be unable to expand their operation and increase their production. Production would be limited to no more than 25,000 tons per year. The right-of-way would disturb 7.15 acres. No more than 12 acres would be disturbed during the next five years or 19.15 acres, including the road right-of-way.

2.3 Alternatives Considered, But Rejected

Other locations within the Hebe mining claim group were considered, but were rejected because lack of access would require additional road construction which would increase the amount of disturbance and also increase the corresponding impacts. The Dizzy mining claim group located in Sections 4 and 5, T.24S., R.8E., have the same problems. No other mining claims were

addressed, as no options on those claims are held and there is no authorization from any of the other mining claimants. Therefore, assessment of a mine on other claims would be highly speculative.

3.0 Affected Environment

3.01 General Setting

The subject land is located on the southwestern flank of the San Rafael Swell, a breached, doubly plunging anticline.

The subject land is public land and is open to location (mineral entry under the General Mining Law of 1872, as amended). Master Title Plats disclose that both the surface and mineral estates are owned by the Federal Government and managed by the Bureau of Land Management. The subject land is managed by the Price Area Office and within the San Rafael Planning Unit.

The nearest town is Emery, which is located approximately 16 miles northwest of the proposed operation.

The following mandatory items have been considered for this environmental assessment and will not be impacted: threatened and endangered animals, areas of critical environmental concern, cultural or historic resources, floodplains and wetlands, water resources, air quality, paleontological resources, prime or unique farmlands, wild and scenic rivers, native American religious concerns, and hazardous/solid wastes (see Appendix B).

3.11 Climate

The climate in the area is arid and is characterized by warm winters and hot summers. Precipitation averages 6-8 inches per year, and temperatures range from an average low of about 10 degrees Fahrenheit in January to an average high of over 90 degrees Fahrenheit in July and August. As the Proposed Action would not impact climate, there will be no further discussion of climate in this environmental assessment.

3.12 Air Quality

Air quality in the area is generally good and is in attainment with the National Ambient Air Quality Standards. The subject land is located within the Upper Colorado River airshed, which is designated as a Prevention of Significant Deterioration Class II Area. Prevention of Significant Deterioration Class II areas are those that may be developed, and the release of limited concentrations of certain pollutants over ambient levels is permitted as long as National Ambient Air Quality Standards are maintained. The nearest Prevention of Significant Deterioration Class I area is Capitol Reef National Park, located about 20 miles to the southwest of the project area. Air quality is not currently being monitored within the area; however, it is expected that standards are being met due to the absence of extensive development.

Fugitive dust due to uncontrolled wind-carried particles from natural sources and traffic on unpaved roads is the principal pollutant in and around the project area. Climatic factors such as prevailing winds, atmospheric stability, and mixing heights affect air quality by influencing the ability of air to disperse or dilute pollutants. Unstable conditions caused by vertical movement of air that is heated during the day plus moderate to high wind speeds provide conditions conducive to dispersing and diluting pollutants and maintaining air quality.

3.13 Geology

3.13.1 Overview

The subject land is located on the Colorado Plateau, a broad, relatively flat region extending from central Utah into western Colorado and northern New Mexico and Arizona. Regional drainage is southeast into the Dirty Devil River, which is a tributary of the Colorado River. The mine expansion area is located upon the Jurassic Carmel Formation. The Carmel Formation is composed of a mixture of sediments, including shale, sandstone, siltstone, limestone, and gypsum. The formation dips to the west at 5-7 degrees. The depth to the gypsum ranges from 0 to 14 feet. The overburden is composed of residuum from the Carmel Formation.

3.13.2 Mineral Resources Including Oil and Gas

Gypsum is the principal mineral resource within the project area, which has high potential for gypsum development. The gypsum deposit is described in Section 2.12.1.

The Chinle Formation, which is known to contain productive uranium deposits in Emery County, underlies the project area at depths of greater than 1,000 feet. Uranium deposits likely consist of small pod-like bodies. Small limestone deposits may occur in the Carmel Formation in this area, but the area's development potential has not been thoroughly investigated. Petroleum resources (oil and gas) may occur at depth in the Kaibab Limestone and Moenkopi Formation, and the area has moderate potential for oil and gas occurrence. Since the Carmel Formation is stratigraphically lower than the Cretaceous coal-bearing beds, there are no known recoverable coal resources in the vicinity of the project area.

3.13.3 Geologic Hazards

Relative to other areas in Utah, there is little seismic activity in the Colorado Plateau area; however, there is potential for moderately large-scale earthquakes in the vicinity of the project area. In 1988, a 5.3 magnitude earthquake occurred in central Emery County. Its epicenter was approximately 12 miles southeast of Castle Dale or about 21 miles northeast of the project area.

The earthquake, which was classified as V to VI on the modified Mercali scale (felt by nearly everyone), was felt throughout Utah, as well as in Colorado and New Mexico, and it caused minor damage in the region. There were six foreshocks and two aftershocks. Earthquakes frequently occur along the San Rafael Swell.

No other known geologic hazards, such as landslides, subsidence, shallow groundwater, flood-prone areas or sand dunes, are present within or adjacent to the project area. Because impacts to or from geologic hazards are highly unlikely, this subject in not addressed any further in this environmental assessment.

3.13.4 Paleontological Resources

Paleontological resources include the remains or traces of any prehistoric organism which has been preserved by natural processes in the earth's crust. Fossils of scientific interest include those that are unique, unusual, or rare; diagnostically or stratigraphically important; or which add to the existing body of knowledge in specific areas of geology and evolution. Paleontological potential of rocks within the proposed mine expansion area was evaluated using existing literature.

The Carmel Formation was deposited in a marine environment in which fossil marine microfauna, mostly bivalves and filter feeders, and fossil traces such as burrows and trails have been preserved. Gypsum is an evaporite deposit, which is an environment in which fossils are unlikely to have been preserved. It is unlikely that significant fossils are present in the project area. If important fossils are discovered during mine expansion or operations, surface-disturbing activities at the site would cease until a Bureau of Land Management-approved paleontologist could evaluate the site and appropriate mitigation measures could by implemented. Since the Proposed Action is not likely to adversely affect any significant fossils, this resource is not discussed any further in this environmental assessment.

3.13.5 Topography

The project area consists of a series of small rolling hills on the western end, which become flatter towards the eastern end. Elevation ranges from 5,480 feet on the western end to 5,560 feet on the eastern end. The subject land is cut by two dry washes running in a north-south direction.

3.14 Soils

The proposed expansion is located in an area composed of the Gypsumland-Mussentuchit-Robroost soil association. The association is composed of as follows: Gypsumland, 35 percent; Mussentuchit, 30 percent; Robroost, 20 percent; and other inclusions, 15 percent. All three soils in this association have been classified as highly susceptible to wind erosion and also have a high potential for salt production. Because these soils are derived from gypsiferous rock, they are also very susceptible to water erosion. These soils have been classified as critical soils in the San Rafael RMP due to their high erosion rates when disturbed. These desert gypsic soils have just recently been classified as such by the Natural Resource Conservation Service. Soil thickness ranges from nil to several feet, but averages approximately one foot over the subject land. As water is drawn down into the soil, it tends to dissolve the gypsum and creates little underground channels known as "pipes." As these pipes converge, they create larger diameter pipes until eventually they are unable to support the roof, which collapses. When the roof collapses, a surface gully appears seemingly out of nowhere with a fully intact drainage system.

The Gyspumland soil is composed of nearly pure soft gypsum found on slopes ranging from 2 to 20 percent. As such, it is unstable and erodes easily and lacks virtually any vegetation except for cryptogamic crusts. It is a newly named series and no information on its characteristics is available. It is closely related to the older "Goblin Series." The Goblin soils are loamy, gypsic shallow (12 inches) Typic Torriorthents.

The Mussentuchit soil is moderately deep (20-40 inches) and is found on 3 to 20 percent slopes. This soil is classed as a coarse-loamy, gypsic Typic Gypsiorthid.

The Robroost series is a very deep soil (60 inches) found on 2 to 8 percent slopes. These soils are coarse-loamy, mixed Cambric Gypsiorthids.

Table V
Soil Characteristics in the Project Area

Soil Series	Slope (%)	Series % of Assoc	Landscape Position	Texture	Depth	Drainage	Limitations
Gypsumland	2-20	35	steep back slope of cuestas	pure soft gypsum	shallow	well drained	gypsum, precipitation
Mussentuchit	3-20	30	edge of cuestas & ridges of backslopes	fine sandy loam	moderately deep	well drained	gypsum, precipitation
Robroost	2-8	20	backslopes of cuestas	fine sandy loam	very deep	well drained	gypsum, precipitation
Contrasting Inclusions	2-20	15	various	unknown	unknown	unknown	gypsum, precipitation

Soils within the project area support very sparse vegetation, but are relatively well stabilized in most areas by the presence of cryptogamic or microbiotic crusts which are commonly found on gypsiferous soils. These cryptogamic crusts are composed of bacteria, algae, mosses and lichens. They are believed to promote soil stabilization. The stability of the soil surface is readily apparent where lichens and mosses grow in abundance; however, algae, especially filamentous algae, are probably the most effective in binding the surface soil particles together and thereby fostering soil stability. It is estimated that cryptogamic crusts cover approximately 50 percent of the subject land or about 13 acres. OHV tracks have previously damaged the cryptogamic crusts in the project area.

3.15 Water Resources

3.15.1 Surface Water

The project area lies within the Dirty Devil/Colorado River watershed. The subject land drains southward into Willow Springs Wash, an ephemeral stream running west to east, which in turn drains into the Muddy Creek. An ephemeral wash about 20 feet deep cuts through the center of the proposed mine area in a north-south direction. The plan of operations details flow projections for this wash and one other ephemeral wash which occur within the boundary of the Proposed Action. There is no live water on the subject land. The nearest perennial stream is Muddy Creek, which is located one mile to the east. Muddy Creek is designated as a non-game warm-water fishery and as an agricultural water source.

Surface flow occurs during spring runoff and in response to summer storms. It rains about 15 days per year and annual precipitation is between 6 and 8 inches, so surface flow events are relatively rare and typically small, although flash floods may occur. Annual mean flow at the gauging station on the Muddy Creek near Interstate 70 is 40 cubic feet per second and the mean high flow is 86 cubic feet per second. The maximum recorded discharge was 3,340 cubic feet per second in 1952, but often flows of 500 cubic feet per second occur annually. Because there is little vegetation on the subject land, surface runoff from the area is rapid.

BLM has acquired a temporary (20-year) right to use water from the Muddy Creek for dust suppression by the gypsum industry. According to the 1996 Utah Water Quality Report to

Congress, Muddy Creek currently does not support agricultural use due to excessive total dissolved solid (TDS) concentrations. The average concentration of TDS from 1992-1996 was 2300 milligrams per liter. Water from the Muddy Creek is generally suitable for livestock and wildlife watering and dust suppression; it is not suitable for human consumption.

3.15.2 Groundwater

Although the Carmel Formation is known to contain limited quantities of groundwater in other places in central Utah, no groundwater has been encountered during mining operations. The underlying Navajo Sandstone is an aquifer, but there is a sequence of mudstones and siltstones (aquacludes) between the formation and the gypsum beds, so there is no interchange between the formations. It is unlikely that the Proposed Action would adversely impact groundwater, and the resource is not discussed further in this environmental assessment.

3.16 Noise

Wind and heavy equipment are the primary sources of ambient noise within the project area. Other noise sources include off-road vehicles, other recreational users, horses, and aircraft.

The A-weighted sound pressure level, or A-scale, is used extensively in the United States for the measurement of community and transportation noise. The A-scale is a measure of noise in A-weighted decibels (dBA), which is directly correlated with some commonly heard sounds (see Table VI). The highest noise levels are generally correlated with the operation of heavy equipment.

Table VI
Comparison of Measured Noise Levels with Commonly Heard Sounds

Source	dBA	Description
Normal breathing	10	Barely audible
Rustling leaves	20	
Soft whisper (at 5 meters)	30	Very quiet
Library	40	
Quiet Office	50	Quiet
Normal Conversation (at 1 meter)	60	
Busy traffic	70	
Noisy office with machines; factory	80	
Heavy truck (at 15 meters)	90	Constant exposure endangers hearing

The State of Utah has developed five noise abatement categories. Category A is for very sensitive areas and does not allow noise greater than 57 decibels, while Category B is for sensitive areas and the limit is 67 decibels. Category C is not sensitive and the limit is 72 decibels. The project area is in Category C, which includes areas used for dispersed recreation, and there are no limitations on noise. Category E relates to interior noise and does not apply. Emery County does not have an ordinance for noise.

3.2 Vegetation

3.21 Plant Communities

The area's vegetation is comprised of one community type--desert shrub. Mat saltbush is the dominant shrub and comprises about 83 percent of the shrub population. Vegetation in the area is sparse and consists of Indian ricegrass, Torrey Mormon tea, prickly pear cactus, Rubber rabbitbrush, green molly, four-wing saltbush, mat saltbush, winter fat, and Galleta grass. A complete list of plants occurring in the project area can be found in Appendix F.

Results of the vegetation survey conducted in 1996 indicates the following:

vegetation is relatively sparse and dominated by shrubs;

cryptogamic crusts are abundant and provide a substantial amount of ground cover throughout the project area, except on shale outcrops. Visual estimates of cryptogamic crust probably underestimate actual crust cover because the bacteria and associated structures cannot be seen with the naked eye and may occupy areas that appear to be bare ground. A detailed description of cryptogamic crusts are presented in Section 3.22.

The percentage of cover and the percentage of shrub occurrence within the shrub community is shown in Table VII.

Table VII
Percentage of Cover and Shrub Density

Cover Type	Species	Cover (%)	Shrub Density (%)
Grasses	*Oryzopsis hymenoides*	0.49	
	Hilaria jamesii	0.26	
Forbs	*Brassica spp.*	0.08	
Shrubs	*Atriplex corrugata*	2.60	83.11
	Chrysothamnus nauseosus	1.47	4.62
	Ephedra torreyana	1.25	4.07
	Atriplex confertifolia	0.42	6.25

	Kochia americana	0.08	1.52
	Eurotia lanata	0.04	0.16
	Sclerocactus wrightiae	0.04	0.16
	Sphaeralcea parvifolia		0.05
	Artemisia nova		0.05
Bare Ground including Cryptogams		85.81	
Litter		6.72	
Rock		0.75	

3.22 Cryptogamic Crusts

Cryptogamic crusts are common throughout the arid regions of the western United States and are conspicuous on gypsiferous soils in central and southern Utah. They are composed of bacteria, algae, mosses, and lichens, and there is increasing evidence that microbiotic crusts are an important component in arid and semiarid ecosystems. Most importantly, they are thought to promote soil stabilization. Where lichens and mosses grow in abundance, the stability of the soil surface is readily apparent; however, algae, especially filamentous algae, are probably most effective in binding surface soil particles and fostering soil stability.

Cryptogamic crusts are particularly abundant on the gypsiferous soils which are more prevalent on the western portion of the project area. They are less abundant on the eastern portion. Cryptogamic crusts occur on approximately 59 percent of the project area. A series of off-road vehicle tracks has damaged cryptogamic crusts in portions of the project area.

3.23 Threatened and Endangered Plant Species

The Wright fishhook cactus (Sclerocactus wrightiae), which is an endangered plant, occurs on the proposed expansion area. It is estimated that about than 316 individuals occur in the mine expansion area. Over 1,000 plants were estimated to occur in the originally proposed 81.5 acre expansion area. No other threatened or endangered plants were found on the subject land. Surveys conducted on the surrounding areas found the following densities:

Survey Area	Plot Size (feet)	No. of Cactus Found	Density (No. Per Acre)
1	100X440 (1.01 acre)	29	29
2	100X100 (0.23 acre)	18	78
3	100X100 (0.23 acre)	46	200
5	100X100 (0.23 acre)	5	22
6	100X100 (0.23 acre)	37	161
Old Mine Area	80 acres	1,000	13
New Mine Area	26	316	12

Additional information concerning the Wright fishhook cactus can be found in Appendix D included in the Biological Assessment.

No other threatened, endangered, or sensitive plant species were found in the area.

3.3 Wildlife

Appendix G provides common and scientific names of animal species discussed in the following section.

3.31 Big Game, Raptors, and Other Wildlife Species

3.31.1 Big Game

Big game use of the project area is likely limited to a small number of desert bighorn sheep and possibly infrequent use by mule deer and antelope. The Bureau of Land Management has designated the subject land as yearlong habitat for desert bighorn sheep. Utah Division of Wildlife Resources has not designated habitat for any big game species in the project area.

3.31.2 Raptors

American kestrel, prairie falcon, red-tailed hawk, Swainson's hawk, ferruginous hawk, merlin, peregrine falcon, and golden eagle may use the area for foraging, particularly during the late spring and summer. Rough-legged hawk and bald eagle may occasionally use the area during the winter months.

Suitable nesting habitat within the project area for any of the above raptors in the project area is minimal or lacking. Since the Proposed Action should not impact raptors, no further mention of raptors will be made in this environmental assessment.

3.31.3 Other Species

Mammals--Based on range and habitat preference, about 23 species of nongame mammals may occur on the project area. Predator species include coyote, red fox, gray fox, badger, striped skunk, and mountain lion. Lagomorph species include desert cottontail, whitetail jackrabbit, and blacktail jackrabbit. Other small mammal species potentially present in the general area include golden-mantled ground squirrel, white-tailed antelope squirrel, northern pocket gopher, cliff chipmunk, Ord's kangaroo rat, deer mouse, brush mouse, pinyon mouse, and northern grasshopper mouse. Additionally, several bat species, such as little brown myotis and California myotis, may occur on or adjacent to the area. No prairie dogs are found in the area so there is little likelihood of the black-footed ferret frequenting the project area.

Birds--Common passerine species which may occur on the subject land include rock wren, western kingbird, Say's phoebe, common raven, horned lark, American crow, pinyon jay, cliff swallow, and white-crowned sparrow. Many other species of passerines also may occur on the project area, based on range and habitat preference. Upland game birds potentially occurring in the area include mourning doves.

Amphibians and Reptiles--Several species of amphibians and reptiles may occur in the project area, based on range and habitat preference. Amphibian species most likely to occur in or near the area include the Utah tiger salamander, Great Basin spadefoot, chorus frog, and leopard frog.

If present, these species would occur primarily in and adjacent to limited water habitats available outside the project area. Reptile species may include collared, sideblotched, and short-horned lizards, Great Basin whiptail, and western terrestrial garter snake.

Fish--No permanent water occurs within the project area. Therefore, no fish species are likely to occur within the project area.

3.32 Wild Horses

The subject land is within the Muddy Creek Herd Management Area (MCHMA) for wild horses. The MCHMA contains about 137,110 acres of Bureau of Land Management managed land.

Management level objectives are being prepared for horses within the Price River/San Rafael Resource Area by herd unit and the MCHMA management objective is 30 to 55 head of horses. Following a 1995 summer roundup at Devil's Canyon, approximately 70-80 horses were estimated to be in the MCHMA in 1995. Ninety-two head of wild horses were counted during a 1997 aerial survey. Thus, it is likely that current populations exceed management levels. A horse roundup is scheduled for 1998 for the removal of about 60 head of horses.

Because of its limited availability and scattered distribution, water strongly influences the distribution of horses throughout the MCHMA. Muddy Creek is located about one mile east of the project area. This water source is probably used extensively by wild horses and livestock, particularly during dry periods.

No wild burros exist on or near the proposed project area.

3.33 Threatened and Endangered Animals and Species of Special Concern

Bald eagle, peregrine falcon, bonytail chub, razorback sucker, humpback chub, and Colorado squawfish are threatened and/or endangered animal species that may occur in or adjacent to the project area. In addition, ferruginous hawk and desert bighorn sheep are species of special concern which may occur in or near the project area. Peregrine falcon is a Federally endangered species which is unlikely to be affected by the Proposed Action; thus, this species will not be addressed further.

3.33.1 Bald Eagle

The bald eagle is a Federally threatened species which requires cliffs, large trees, or sheltered canyons associated with concentrated food sources, such as fisheries or waterfowl concentration areas, for nesting and roosting. Bald eagles forage widely during the non-nesting season (fall and winter), scavenging on animal carcasses such as deer and elk.

No officially designated critical habitat exists in the project area for the bald eagle. The lack of suitable nesting trees adjacent to water and roosting trees in sheltered locations limits the potential for bald eagle use of the project area. However, bald eagles may occasionally feed or land in the area, particularly in the winter.

3.33.2 Fish

Four endangered fish species occur in east-central Utah: Colorado squawfish, razorback sucker, bonytail chub, and humpback chub. Critical habitat for the Colorado squawfish in Emery County

is limited to the Green River from the confluence of the Yampa River south. Razorback sucker critical habitat also occurs in the Green River in Emery County; however, the project area is within the Dirty Devil River drainage and, thus, the proposed mine expansion would not affect habitat within the Green River. Mining is unlikely to affect fish habitat in the Colorado River; therefore, these species are not discussed further. No critical habitat for the bonytail chub or humpback chub exists in Emery County.

3.33.3 Ferruginous Hawk

The ferruginous hawk is a former Category 2 candidate species and is currently a Federal species of special concern. Ferruginous hawks nest in low cliffs, buttes, and cutbanks, as well as in junipers or sagebrush along the edges of pinyon-juniper communities. They feed primarily on small- to medium-sized mammals such as jackrabbits, cottontail rabbits, ground squirrels, and prairie dogs. No nests or individuals of this species were observed during an on-site survey of the area in August 1996. This species likely uses the project area for foraging, although it is unlikely to use the area for nesting.

The project area provides little to no important desert bighorn sheep habitat. Limitations of the area include lack of high-quality escape terrain, such as steep, rock, or rugged slopes, and limited availability of water. The subject land is just within an area designated by the Bureau of Land Management as yearlong range for desert bighorn sheep. Except for an occasional dispersing ram, this species is unlikely to frequent the project area. Thus, the Proposed Action is not likely to impact desert bighorn sheep and this species is not discussed further in this environmental assessment.

3.4 Cultural Resources

A Class III cultural resource inventory of the project area was completed in August 1996. The 1996 study entailed a Class III inventory of the proposed mine expansion area. No cultural resources were found during the inventory. Also, a conclusion was made that no National Register of Historic Places sites would be affected by the proposed expansion. The cultural inventory report can be found with the Plan of Operations in Appendix A. Since the Proposed Action is not expected to impact cultural resources, it will not be addressed further in this environmental assessment.

3.5 Land Use

All 25.75 acres within the project area are publicly owned and administered by the Bureau of Land Management. The principal land uses within the project area are livestock grazing, wildlife habitat, and dispersed outdoor recreation such as OHV use and horseback riding.

3.51 Livestock Grazing

The proposed mine expansion is in the Lone Tree grazing allotment. Grazing use for livestock is minimal due to the limited amount of vegetation. The carrying capacity of the allotment is 20 acres per animal unit month (AUM), which is the amount of forage required to feed one cow or five sheep for one month. Actual carrying capacity of the subject land is estimated to be 26 acres per AUM, The Lone Tree allotment has 5,251 AUMs on Federal land. The grazing season is from November 1 through April 15. There is one range improvement in the project area consisting of a breached reservoir.

3.52 Recreation

The subject land is within the San Rafael Extensive Recreation Management Area which is managed by the BLM for dispersed recreation. There are no developed recreation areas within or adjacent to the proposed mine expansion. Land in and adjacent to the subject land offers a wide range of recreational opportunities, including OHV use, sightseeing, hiking, horseback riding, and rock collecting. OHV use is probably the main recreational activity in the area. The subject land is in an area which has OHV use limited to designated roads and trails. The road between Lone Tree Crossing and Fremont Junction is maintained by Emery County and is used by OHVs. The county road also provides access to two-track trails within and surrounding the subject land. The number of recreational users is not known, but it is relatively small in comparison with areas such as Temple Mountain and Buckhorn Wash. It is certainly no more than one recreationist per 12-hour period and is probably much less. Observed recreational use is primarily all-terrain vehicles (ATV), off-road motorcycle use and horseback riding. These uses occur mostly in the spring and fall. Recreational use is addressed in this environmental assessment in terms of opportunity for recreation provided by an area or landscape.

The Lone Tree Wedge area is within the San Rafael Deer Unit, The San Rafael Pronghorn Antelope Unit, and the South San Rafael Desert Bighorn Sheep Unit. Between 1990 and 1994, 363-946 deer hunters harvested 97-457 deer from the San Rafael Deer Unit; hunter success ranged from 25-49 percent. Very few hunters (6-11 per year since 1988) have hunted pronghorn antelope in the San Rafael Unit, and there was no hunt in 1992 or 1993. Hunter success ranged from 67-100 percent. In 1993 and 1994 in the South San Rafael Desert Bighorn Sheep Unit, four and five desert bighorn sheep permits were sold respectively; each hunter harvested a ram, for 100 percent hunter success. However, no harvest of pronghorn or desert bighorn sheep is known from the Lone Tree Wedge area.

3.53 Land Status and Prior Rights

There are no prior authorizations, such as oil and gas leases or rights-of-way grants (except for the road right of way granted to the operator), on public lands within or adjacent to the project area.

3.54 Wilderness Study Areas and HR.1500 Lands

The Muddy Creek Wilderness Study Area (WSA) is located about 0.4 mile east of the eastern end of the proposed operation (see Map 1, Appendix I). HR1500 areas are lands in Utah which have been proposed for designation as wilderness by Congress in House Resolution-1500. The proposed mining activity would occur in the western portion of the Muddy Creek HR1500 unit. The Upper Muddy Creek and Mussentuchit HR1500 units are located west of the Muddy Creek HR1500 unit and the Cedar Mountain HR1500 unit to the southwest. Statewide there are 3.2 million acres currently designated as WSAs out of the 5.7 million acres of HR1500 lands. The Secretary of the Interior has directed the Bureau of Land Management "to pay careful and particular attention to development proposals that could limit Congress' ability to designate certain BLM area in Utah (HR1500 lands) as wilderness, even though these areas have not formally been designated WSAs." The subject land has ATV tracks crossing it and before the 1.5 mile access road was upgraded, there was a well-traveled route which ended at the mine site. In addition, an access route comes in from the north and accesses the old reservoir located in the center of the proposed mine expansion area. There is also a five-acre mine located at the site.

3.6 Visual Resources

The landscape surrounding the project area is predominantly undeveloped desert (except for the mine), with broad, uninterrupted vistas. Colors are predominantly browns and grays.

The Bureau of Land Management's Visual Resource Management (VRM) system is an analytical process that seeks to identity, set, and meet objectives for maintaining scenic values and visual quality. The relative value of the visual resources is indicated by one of four assigned classes. Classes I and II are the most valued, Class III is of moderate value, and Class IV is the least value. The area encompassed by the proposed action is in VRM Class IV, which has the lowest visual value of the four VRM classes. The county road passes through areas containing VRM Classes II, III, and IV. The Class II area is located on the western edge of Emery County and this class represents higher visual values than Classes III or IV.

The objective for Class II is to retain the existing character of the landscape; management activities may be seen, but should not attract the attention of the casual observer. Changes to the characteristic landscape should be low, and changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the existing landscape.

The objective for Class III is to partially retain the existing character of the landscape; moderate changes to the existing landscape are allowed, although management activities associated with these changes should not dominate the view of the casual observer. As in Class II, changes should repeat the basic elements of the characteristic landscape.

The objective for Class IV is to provide for management activities that require major modification of the existing character of the landscape. Although management activities may dominate the view and be the major focus of viewer attention, every attempt should be made to minimize the impact of these activities through careful location selection, minimal disturbance, and repetition of the basic elements of the characteristic landscape. The relative change to the characteristic landscape can be high.

3.7 Hazardous Materials

There are no known existing hazardous material sites within or adjacent to the project area. Hazardous material used for the operation are described in Section 2.15 and are being and would continue to be used, stored, and disposed of according to state and Federal regulations.

3.8 Traffic

The traffic rate for Interstate 70 in Salina Canyon averages 6,520 vehicles per day. Of this total, 3,825 of these vehicles are trucks. The county road, used as an access road, is not used as a destination route for recreationists, so use is low. The county road has recently made an application of magnesium chloride to the road in order to control dust and maintain the integrity of the road. The county road is approximately 31 miles long. The road is narrow just north of Willow Springs and Sevier County has made an application for a right-of-way in order to widen the road.

4.0 Environmental Impacts and Mitigation Measures

Environmental consequences of the expansion and operation of the proposed gypsum quarry are discussed below for each potentially affected resource under each alternative. Discussion of

impacts that can be reasonably expected from implementation of the project are included, and mitigation measures and residual impacts are discussed where appropriate. Applicant-committed mitigation measures, presented in Section 2.19, are part of the Proposed Action, and impact analyses assume that these mitigation measures would be effectively implemented. Additional mitigation measures are recommended for some resources to further minimize impacts. All impacts described in this chapter are post-mitigation impacts and were evaluated assuming a maximum disturbance of 25.75 acres at any one time.

An environmental impact is defined as a modification of the existing environment brought about by development activities. Impacts can be a primary result of the action (direct) or a secondary result (indirect), and can be permanent or long-lasting (long-term) or temporary and of short duration (short-term). Impacts can vary in degree from only slightly discernible to a total change in the environment.

Short-term impacts occur during and immediately after the conclusion of construction. Although short in duration, such impacts are normally obvious and disruptive. For this project, short-term impacts are defined as lasting five years or less. Long-term impacts are changes made in the environment during project operation that remain longer than five years.

Cumulative impacts result from the incremental impacts of the proposed project added to past, present, and reasonably foreseeable future actions. Because this project involves expansion of a gypsum mine, which has an attendant road right-of-way, the cumulative impacts analysis includes impacts from the Proposed Action plus other gypsum mines in the planning area and other rights-of-way in the township (T.24S., R.7E.). The following mines and rights-of-way are included in the cumulative impacts analysis:

1. Gypsum Resource Development, Inc. Mine, Section 23, T.19S., R.10E.; 4.5 acres of disturbance.
2. Sutherland Brothers Mine, Section 15, T.24S., R.13E.; 1.0 acre of disturbance.
3. Georgia-Pacific Corporation Mine, Sections 29 and 30, T.22S., R.9E.; 26 acres of disturbance.
4. Diamond K Mine, Section 29, T.22S., R.9E.; 10.0 acres of disturbance.
5. U.S. Gypsum Company Mine (proposed), Section 21, T.23S., R.8E.; 66 acres of disturbance.

4.1 Physical Resources

4.11 Air Quality

4.11.1 Proposed Action

Short- and long-term increases in particulate dust and trace gas emissions would result from mine development and operation activities. Principal sources of dust emissions would be vehicular traffic on the roads, blasting, stockpiling rock, and using a surface mining machine if Western Clay Company elects to use one. The magnitude of these impacts would vary, depending on daily weather conditions and distance from the mine. For example, on windy days, which prevail in this area, dust would be readily dissipated and impacts to air quality would be minimal, except in the immediate vicinity of moving equipment where substantial amounts of dust would notably impact air quality. Utah Division of Air Quality regulations mandate that any person who owns or operates a mine shall minimize fugitive dust as an integral part of site preparation, mining activities, and reclamation operations (Utah Division of Air Quality, Rule No. R307-12).

Total suspended particulate (TSP) emissions from haul trucks and pickup trucks traveling on the access road were estimated to average 81-405 tons per year and particulates less than 10 microns in size (PM) emissions would average 13-61 tons per year, depending upon production levels. Dust emissions from drilling and blasting were not calculated because these activities would occur infrequently. Since surface mining machines are a relatively new technology, average dust emissions are not accurately known. However, using data from the most comparable type of equipment, a scraper at a coal mine, PM emissions from the surface mining machine would average 3-15 tons per year. Emissions created by dumping rock into stockpiles were also assumed to be similar to those for coal and would average 0.2-0.7 tons PM per year.

At the current production level of 20,000 tons per year, PM emissions are about 16 tons per year. At a production level of 100,000 tons per year, estimated PM emissions would be approximately 77 tons per year. Ambient dust emissions have not been measured in this area; because the area is windy, there is probably a substantial amount of airborne material. Livestock and wildlife grazing and ORV use also contribute to wind erosion and increases in airborne particles. The mine expansion would increase the PM amount by up to 61 tons per year, or a total of 77 tons per year, which according to Federal regulations is considered to be a minor source and is defined as any source emitting less than 250 tons of particulates annually.

Western Clay Company would obtain an air quality permit from the Utah Division of Air Quality, which would require monitoring and mitigation. Hydrocarbons, nitrogen oxides, carbon monoxide, and sulfur dioxide emissions would temporarily increase during mine development and operation. No carbon dioxide emissions exceeding suggested health practice standards (5,000 parts per million annual average) would occur.

The project would remain in compliance with Utah Air Quality Rule R307-12 and the Clean Air Act and thus would not cause unacceptable impacts to air quality.

4.11.2 No Action Alternative

TSP would be about 81 tons per year for truck traffic, while PM emissions would be approximately 16 tons per year.

4.11.3 Mitigation

Using a water mist attachment on the reclaimer and spraying water onto areas producing dust in the mine would reduce the amount of particulates in the air.

4.12 Mineral Resources and Topography

4.12.1 Proposed Action

Because there are no active mineral or oil and gas leases other than the operator within the project area, the Proposed Action would have negligible impacts on mineral resources. Recoverable reserves of uranium or oil and gas may exist within the project area, but the potential for future exploration and extraction over the life of the project is low. The Proposed Action would result in gypsum removal and depletion of this resource, but, as described in Chapter 1.0, there is a demonstrated need for gypsum products within the intermountain region. The surface of land would be reduced by approximately 20 feet in height where mining occurs, which would total 25.75 acres.

4.12.2 No Action Alternative

Under the No Action Alternative, impacts to mineral resources would be about 50 percent of those of the Proposed Action. However, an alternative gypsum source would probably be necessary to supplement production and thereby meet market demands. Topography would be reduced by 20 feet on about 12 acres.

4.12.3 Mitigation

No mitigation for impacts to mineral resources would be necessary. In the event a developer proposes to explore for minerals within or adjacent to the project area, the potential for conflicts with the mine would be analyzed in an appropriate National Environmental Policy Act document.

4.13 Soils

4.13.1 Proposed Action

At any given time, up to 25.75 acres of soils would be disturbed; overall project disturbance would depend on mining rates, gypsum quality, and market demands. Since the entire project area is mapped as having critical soils, avoiding critical soils under the Proposed Action is not possible. Most of the disturbance would occur with the Gypsumland-Mussentuchit-Robroost association, which is considered to be a critical soil.

Soil disturbance would occur due to vegetation clearing and soil salvage during mine expansion. Disturbance would result in accelerated erosion, loss of soil fertility and structure, soil compaction, and temporary loss of productivity. Soil cryptogamic crusts are extremely important soil stabilizers in the project area, and severe wind erosion could occur once these crusts are removed.

Loss of soil fertility and soil structure would occur during soil salvage and stockpiling. Loss of fertility would occur due to reduced biological activity caused by disruption of soil microorganisms and plant roots. Soil structure such as soil horizons and other physical properties would be partially destroyed due to mixing of soil profiles and breaking of soils peds (soil building blocks). Because of these effects, soils would be less productive.

Temporary soil compaction would be caused by heavy equipment traffic. Compaction due to raindrop impact may result in reduced productivity due to soil loss, damage to soil structure, decreased infiltration, and decreased water storage capacity.

Because the overall acreage of the disturbance would be small and because Western Clay Company would implement erosion practices, including reclamation and implementing a stormwater plan, most of the soil would be retained in the mine and total soil loss would be small and would not appreciably affect the area's potential productivity once reclamation is complete.

4.13.2 No Action Alternative

Under the No Action Alternative, soils would be disturbed at a level which is 50 percent of that of the Proposed Action and therefore the impacts to soils would be 50 percent of the impacts of the Proposed Action. Again, the total soil losses would be small and would not appreciably affect the area's potential productivity once reclamation is complete.

4.13.3 Mitigation

No mitigation above and beyond the applicant-committed practices described in the Proposed Action and the Reclamation Plan would be necessary.

4.14 Surface Water

4.14.1 Proposed Action

Impacts to surface water would include increased sedimentation in streams due to accelerated erosion from disturbed areas. However, because the proposed disturbance is small (up to 25.75 acres at any given time) and only a small fraction of the watershed area affected by the project, potential for notable sedimentation within the watershed is negligible. Furthermore, because of Western Clay Company's erosion- and dust-control measures and stormwater retention, and because runoff events are infrequent, potential to appreciably affect surface water would be negligible for the life of the project.

Because roads and stream crossings would be designed to Bureau of Land Management standards, no channel alterations, such as relocation or straightening, are anticipated. The mine road would cross ephemeral channels at two locations. Each crossing would require use of best management practices to maintain present surface runoff patterns and to prevent excessive erosion of channel banks during and after construction. Appropriately-sized culverts would be installed at all stream crossings and maintained by Western Clay Company for the life of the project. Using applicant-committed practices and design standards specified in Section 9113 of the Bureau of Land Management Road Standards Manual, channel and gully erosion due to the Proposed Action would be minimal or would not occur; therefore, impacts to channels and gullies would be negligible.

The operation would use about two acre-feet of water from the Muddy Creek annually. This corresponds to approximately 0.007 percent of the mean annual flow, which is a small depletion of water from the Colorado River system. Use of the 2300 mg/l TDS water on the roads for dust suppression would not elevate TDS levels in the Colorado River to a detectible degree.

4.14.2 No Action Alternative

Under the No Action Alternative, surface water would be impacted at the same level as that of the Proposed Action. The potential for increased sedimentation would be even less and would be negligible, as would impacts to channels and gullies.

4.14.3 Mitigation

No additional mitigation measures are proposed.

4.15 Noise

4.15.1 Proposed Action

The blasting would create noise at a level of 110 decibels. This would last only for 50 milliseconds or less than 0.1 second. In addition to being short-term, blasting would also be infrequent. At one-half mile away, the noise level would drop to 80 decibels. Equipment, such as bulldozers, would cause noise at a level of 93 decibels, with this dropping to about 60 decibels

at one-half mile away. The haul trucks would have a noise level of 85 decibels, which at one-half mile would drop to approximately 55 decibels. There are no sensitive receptors, such as residences, permanently located in the area. All these noise levels are in conformance with Federal, state, and local regulations and ordinances in regard to effects of point sources on persons outside the work area. Workers would comply with requirements for noise protective gear within the work area. Noise impacts would be negligible. Noise impacts on recreational users are discussed in Section 4.51.2.

4.14.2 No Action Alternative

Impacts under the No Action Alternative would be of similar magnitude, but would only occur about 50 percent of the time compared to those under the Proposed Action.

4.14.3 Mitigation

No additional mitigation measures is proposed.

4.2 Vegetation

4.21 Plant Communities

4.21.1 Proposed Action

Vegetation on 25.75 acres would be destroyed over the life of the project; also, 25.75 acres would be destroyed at any one time. Loss of vegetation due to the right-of-way, existing mine, and the proposed expansion would total 32.9 acres. Vegetation removal, temporary changes in vegetation species composition during reclamation, and weed infestations constitute both short-term and life-of-project impacts. Impacts due to vegetation disturbance would also affect soils and wildlife, although these impacts would be less severe than soil mixing during topsoil salvage or wildlife displacement due to mining activities. Productivity would be restored upon completion of reclamation. Livestock and wild horses could destroy newly emergent vegetation, as could OHV traffic

4.21.2 No Action Alternative

Under the No Action Alternative, there would be a loss of up to 12 acres of vegetation, but only five acres would be disturbed at any one time. Livestock, wild horses, and OHVs could destroy newly emergent vegetation on no more than 12 acres.

4.21.3 Mitigation

Areas would be fenced, which would exclude livestock, wild horses, and OHVs, thereby eliminating possible destruction of newly emergent vegetation. With the implementation of applicant-committed practices described in the Proposed Action, the Reclamation Plan, and the previously described mitigation, no additional mitigation would be necessary unless reclamation is unsuccessful after five years. Western Clay Company personnel, under Bureau of Land Management supervision, would be responsible for monitoring reclamation success; revegetation would be repeated, if necessary, until soils are stabilized and a self-sustaining plant/microbiotic crust community is established. If needed, additional measures such as irrigation or transplantation of native species would be developed and implemented by Western Clay Company in consultation with the Bureau of Land Management.

4.22 Cryptogamic Crusts

4.22.1 Proposed Action

Under the Proposed Action, up to 13 acres of cryptogamic crusts would be disturbed at any one time by mine development and mining. About 13 acres of cryptogamic crust would be disturbed over the life of the project. Cryptogamic crusts are easily destroyed by trampling and one pass with a motorized vehicle is sufficient to ruin crust structure. Stockpiling crust for periods longer than one or two months causes mortality of buried crust-forming organisms. Impacts due to loss of the crust structure would be long-term. Impacts due to loss of the organisms could last hundreds of years. However, with the implementation of mitigation measures described in the Proposed Action and the Reclamation Plan, it would be possible to preserve crust-forming organisms and promote crust recovery during reclamation, such that the first stages of crust recovery would occur within a few years and crust structure would exhibit good recovery in tens of years. Therefore, no permanent loss of cryptogamic crust cover is anticipated. If crust stockpiles get wet, substantial mortality of buried crustal organisms would occur within one or two months.

4.22.2 No Action Alternative

Under the No Action Alternative, up to three acres of cryptogamic crusts would be disturbed at any one time due to mine development and mining. About six acres of cryptogamic crust would be disturbed over the life of the project.

4.22.3 Mitigation

Crustal material would not be stockpiled for more than one or two months to ensure the viability of the organisms. Where possible, salvaged material would be backhauled directly to prepared soils in reclaimed areas, such that no stockpiling is required. If it is necessary to stockpile cryptogamic crusts for more than two months, the crusts would be stockpiled in long, low piles in order to expose as much surface as possible and retain the maximum amount of viability of the organisms.

4.23 Threatened and Endangered Plant Species and Species of Special Concern

4.23.1 Proposed Action

Approximately 316 individuals of the Wright fishhook cactus would be impacted by the mining and road construction. Formal consultation was initiated with the U.S. Fish and Wildlife Service in January, 1997. A Biological Assessment was developed by the Bureau of Land Management and sent to the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service Biological Opinion stated that the Proposed Action would not jeopardize the continued existence of the Wright fishhook cactus. The Biological Opinion had several conservation recommendations to maintain the population viability of the Wright fishhook cactus. The Biological Assessment and Biological Opinion can be found in Appendix D. Approximately 20 percent of the cactus or 63 specimens are expected to survive the transplanting process. About 253 cactus would not survive.

The following measures would be implemented to assist in maintaining the population viability of the Wright fishhook cactus.

Each of the 316 Wright fishhook cactus would be removed prior to disturbance of the area.

Soil within 1 meter of each Wright fishhook cactus plant to be removed would be removed to a depth of two inches and stored separately from other stockpiles until reclamation.

4.23.2 No Action Alternative

Under the No Action Alternative, approximately 147 individuals of the Wright fishhook cactus would be impacted by mining and road construction. About 20 percent of the cactus or 29 specimens are expected to survive the transplanting process and 139 cactus would not survive the transplantation process.

4.23.3 Mitigation

To ensure maximum results are obtained from the mitigation in Western Clay Company's plan of operation, additional mitigation will be required in addition to applicant-committed procedures.

1. In order to maximize recovery of the Wright fishhook cactus, the soil around the cactus would be placed in low areas after the topsoil has been replaced. This would concentrate the seedbed and the seed in the area having the greatest probability of seed germination and plant survival and would also retain the seed.

2. The seedbed removed with each mine phase would be replaced in the area presently being reclaimed to reduce storage time. The seedbed from the first area would be stored in an open air pit. This would provide a viable seedbed for the final reclamation of the mine.

3. After the cactus are removed, the roots would be pruned and treated with a fungicide. The cactus would be stored with the BLM until the root scars dry and the cacti are replanted. The U.S. Fish and Wildlife Service and the Bureau of Land Management would approve qualified botanist, who would supervise all steps of cactus salvage. This mitigation is experimental in nature and is devised to determine the feasibility of reestablishment of the Wright fishhook cactus.

The U.S. Fish and Wildlife Service also considers the following conservation measures as crucial for maintaining the viability of the Wright fishhook cactus (Sclerocactus wrightiae) population.

1. The company would harvest 50 percent of the seed of the Wright fishhook cactus plants occurring in the project area on an annual basis. Any seed would be stored with the Bureau of Land Management until planted. Western Clay Company would use this seed to augment site revegetation during the reclamation of closed quarry areas.

2. A qualified botanist, approved by the U.S. Fish and Wildlife Service and the Bureau of Land Management, would supervise the revegetation of the project area.

3. The site would be revegetated to accurately reflect the current vegetative community in both species composition and structure.

4. Native species from sources in southwestern Emery County would be used in revegetating the site, in addition to the Wright fishhook cactus.

5. Vehicles would be required to remain on existing roads and in the quarry at all times in order to prevent the possible destruction of specimens of the Wright Fishhook cactus.

The above mitigation would create a habitat in which the Wright fishhook cactus grows and is expected to create conditions which would maximize the probability of success for reestablishment of the cactus.

4.24 Weeds

4.24.1 Proposed Action

Soil disturbance often results in the growth of undesirable plant species, some of which may be considered to be noxious weeds. Weeds typically prevent the growth of desirable native species and reduce the amount of forage available for wildlife and livestock. With the implementation of applicant-committed practices described in the Proposed Action, uncontrolled weed infestations would not occur at the mine site and impacts due to weeds would be minimal. However, noxious weed seeds, such as whitetop, could be carried by trucks and deposited beside the county road.

4.24.2 No Action Alternative

Under the No Action Alternative, impacts due to noxious weeds would be about 25 percent of that of the Proposed Action due to the reduced mining rate.

4.24.3 Mitigation

Noxious weeds growing along the county road could be reported to Emery County Mosquito and Weed Control, which would take care of any noxious weeds brought in by trucks. This would prevent the spread of noxious weeds brought by trucks and equipment from spreading into the area.

4.3 Wildlife

Impacts to wildlife resources would generally be disruption or displacement as a result of operations and human presence and loss of habitat due to surface disturbance. Disruption would occur during mine expansion and operations; habitat loss would occur until reclamation and revegetation are successful. Up to 25.75 acres of wildlife habitat would be disturbed at any one time directly as a result of the Proposed Action; loss of habitat effectiveness in adjacent areas due to human presence, noise, or other factors related to mining would affect a larger area.

4.31 Big Game and Raptors

4.31.1 Proposed Action

Big game use of the project area is limited to infrequent use by small numbers of mule deer, antelope, and bighorn sheep. The project area is located just within an area designated as yearlong habitat for desert bighorn sheep. The area is, however, marginal habitat for bighorn sheep. The Proposed Action is not expected to affect population stability or cause any mortality.

All raptors and their nests are protected from take or disturbance under the Migratory Bird Treaty Act (16 U.S. Code 703-711). Certain species are also afforded protection under the Bald Eagle Protection Act (16 U.S. Code 668d) and Endangered Species Act (16 U.S. Code 1513-1543). Loss of up to 25.75 acres of foraging habitat at any one time would have a negligible impact on raptors, since the area to be disturbed represents a very small portion of available foraging habitat. No raptor mortality or population declines are anticipated.

4.31.2 No Action Alternative

Under the No Action Alternative, impacts to wildlife are expected to be less than 25 percent of that of the Proposed Action because only 5 acres would be disturbed at any one time.

4.32.3 Mitigation

No additional mitigation for impacts to wildlife and fish populations is proposed.

4.32 Wild Horses

4.32.1 Proposed Action

Up to 25.75 acres, or less than 0.001 percent, of the MCHMA would be disturbed at any one time as a result of the Proposed Action. Wild horse movements would be restricted by the truck traffic. Wild horses would be displaced into other portions of the MCHMA due to mining activity and truck traffic for the life of the project. The area of displacement is estimated to be 0.5 mile around the mine site and access road to Willow Springs Wash crossing, and would amount to 2,500 acres, which is 2 percent of the MCHMA. The area of displacement contains little vegetation and no live water. The wild horses would be displaced into surrounding areas which consist of little vegetation and have no live water. Therefore, no loss of wild horses is expected to occur.

4.32.2 No Action Alternative

Up to 5 acres of the MCHMA would be disturbed at any one time as result of this alternative. Wild horse movements would be restricted by truck traffic, but at a reduced level due to the lower levels of traffic. Wild horses would be displaced from 2,300 acres around the mine and access road into other portions of the MCHMA. No loss of wild horses is expected to occur.

4.32.3 Mitigation

A monitoring program of the wild horses would determine to what extent the operation would affect their use of the surrounding land. Once it is determined what the impact, if any, on the wild horse population actually is, remedial measures would be implemented to the extent possible.

4.33 Threatened and Endangered Animals and Species of Special Concern

The U.S. Fish and Wildlife Service determined that the Proposed Action would have "no effect" on bald eagle, peregrine falcon, Colorado squawfish, bonytail chub, humpback chub, or razorback sucker.

4.33.1 Proposed Action

No ferrugincus hawk nests have been observed in the area, but the project area does contain suitable foraging habitat for this Federal species of concern. However, the maximum of 25.75 acres proposed to be disturbed at any one time as a result of the mine expansion represents only a very small portion of available foraging habitat. The Proposed Action is not likely to cause ferruginous hawk mortality or to cause populations to decline.

4.33.2 No Action Alternative

Under the No Action Alternative, only 5 acres of foraging habit of the ferruginous hawk would be disturbed at any one time. The disturbance is not likely to cause any ferruginous hawk mortality or cause any population decline.

4.33.3 Mitigation

No additional mitigation for impacts to threatened and/or endangered species or for species of special concern would be needed.

4.4 Cultural Resources

4.41 Proposed Action

Direct impacts to cultural resources would occur if project activities resulted in the loss or destruction of cultural resources which are eligible for the National Register of Historic Places. No such sites are known to occur in or adjacent to the project area. Subsurface cultural sites could be damaged or destroyed by mine development or mining operations. Indirect impacts could occur through unauthorized collection of artifacts adjacent to the project area.

Because a Class III survey has been completed and no cultural sites were found, little loss of cultural resources would occur due to the Proposed Action.

4.42 No Action Aiternative

Under this alternative, impacts are expected to be only 50 percent of those of the Proposed Action, as only 12 acres would be disturbed during the life of the project compared to 25.75 acres.

4.43 Mitigation

Having the equipment operators cease operations if a cultural site was uncovered would prevent the inadvertent damage or destruction of any subsurface sites, although the possibility of such

occurrence is considered to be remote. Western Clay Company could inform its employees and any contractor's employees that collection of artifacts was forbidden. This would prevent loss of any surface cultural sites in adjacent areas due to the Proposed Action.

4.5 Land Use

4.51 Livestock Grazing

4.51.1 Proposed Action

There would be the loss of approximately 1 AUM per year until reclamation is completed. Total AUMs lost over a 10-year period would be 10 AUMs. This is about 0.02 percent of the carrying capacity of the allotment on an annual basis. The temporary loss of forage would not affect the number of livestock that may utilize the area.

4.51.2 No Action Alternative

There would be the loss of about 0.2 AUM per year until reclamation is completed. Total AUMs lost over a 10-year period would be 2.0 AUMs. This is about 0.004 percent of the carrying capacity of the Lone Tree grazing allotment on an annual basis.

4.51.3 Mitigation

No additional mitigation is proposed.

4.52 Recreation

4.52.1 Proposed Action

Due to dispersed and infrequent recreational use, there should be few impacts to recreational users. OHV users would be directly affected due to the loss of trails within the subject land. The proposed expansion of the mine would curtail access to trails outside the subject land for those trails crossing the mine. Recreationists would be excluded from 25.75 acres over the life of the mine. Another 500 acres would be affected due to restricted access. The primary impacts to recreationists, including OHV users, horseback riders, and hikers, would be the visual impact due to the existence of the mine and the noise associated with the mining operation. The visual impact would be removed after the mine and access road has been reclaimed, as would be the noise. The number of recreationists affected is expected to be small.

The presence of the mine would discourage recreational use in and adjacent to the area. However, because recreational use in this area is dispersed and infrequent, the number of users or potential users affect would be small and, since there are undeveloped areas nearby, similar types of recreational activities could be obtained without substantial inconvenience. Recreational opportunities in the southwestern San Rafael Sweil would not be appreciably altered.

4.52.2 No Action Alternative

The impacts under the No Action Alternative for recreation is expected to be similar to those of the Proposed Action, but reduced by at least 50 percent due to the decreased acreage affected.

4.52.3 Mitigation

No additional mitigation was identified.

4.53 Wilderness Study Areas and HR.1500 Lands

4.53.1 Proposed Action

There would be no direct impacts to the Muddy Creek Wilderness Study Area and the nonimpairment standard would be met. Indirect impacts, such as noise, visual intrusions, and human presence, would extend beyond the actual disturbed area into the adjacent Muddy Creek Wilderness Study Area and may affect the opportunity for solitude or other elements of the wilderness experience. Here, also, these indirect impacts cannot be quantified accurately, but should not extend for more than a few miles.

The Proposed Action could reduce the acreage or preclude Congress from considering the western portion of Muddy Creek unit (HR1500) for wilderness designation until the signs of human activity have been erased after reclamation, which would take 20+ years after reclamation. The Proposed Action would actually disturb only a small portion of the Muddy Creek HR1500 unit, 32.9 acres with the right-of-way out of 207,500 acres, which is approximately .04 percent of the unit. Indirect impacts, such as noise, visual intrusions, and human presence, would extend beyond the actual disturbed area into the nearby adjacent HR1500 area. These indirect impacts cannot be quantified accurately, but should not extend for more than a few miles. Since recreational use in the area is limited, the impacts due to noise are expected to be limited.

4.53.2 No Action Alternative

Under the No Action Alternative, impacts would be approximately 50 percent of those under the Proposed Action Alternative.

4.53.3 Mitigation

No additional mitigation was identified.

4.6 Visual Resources

4.61 Proposed Action

The intrusion for the mine would be within the standards for a Class IV Visual Resource Management area. The truck traffic on the county road would be an existing use and should not cause any degradation of values in areas included in Classes II, III, and IV.

4.62 No Action Alternative

The impacts under the No Action Alternative would be the same as those for the Proposed Action.

4.63. Mitigation

No additional mitigation is necessary.

4.7 Traffic

4.71 Proposed Action

The operation would increase traffic on Interstate 70 by 3-10 trucks per day five days per week one way, which would be 6-20 vehicles for a round trip. This is an increase of 0.15 to 0.5 percent over the 1995 traffic levels on a daily basis. The overall increase would be even smaller because the daily traffic count is for seven days per week and the mine would be operated for only five days per week. Due to the small increase in total traffic, it is believed that any increase in accident rates due to this operation would be very small and will not be addressed any further.

Traffic on the county road would increase to many times the current level of use. However, since local traffic is small, the conflict with other users should be minor. The company is required by Emery County to repair the anticipated damage to this road as needed. Safety on the county roads and the right-of-way could be reduced due to the dust caused by the haul trucks, unless dust control is consistently done. Safety problems due to the narrow road north of Willow Springs would be reduced by widening the road.

4.72 No Action Alternative

The operation would continue at its present rate, which is no more than five trucks per day five days per week. There would be no increase of the traffic on the county road above its current level.

4.73 Mitigation

Road safety would be increased by requiring implementation of dust-control measures whenever a dust plume 200 feet in length stayed over the road due to a moving haul truck. This would pertain to both the county road and the right-of-way. This mitigation would also decrease the suspended particulate rate, which would be within air quality standards.

The county road would be maintained at a higher level by addition of 1 foot of road base and 0.5 foot of aggregate. This would use about 130,000 cubic yards of road base material and 65,000 cubic yards of aggregate. Widening of the current county road is contemplated only for a the road north of Willow Springs in Sevier County. The remainder of the county road would not be widened. A possible source of material is the Windy Peak site just south of Interstate 70 which is in Sevier County and has a free use permit issued to Emery County. The amount of material used in widening the road is included in the above amounts of road base and aggregate.

4.8 Unavoidable Adverse Impacts

4.81 Proposed Action

Unavoidable adverse impacts--residual impacts that would be likely to remain after mitigation--would include the following:

Up to 25.75 acres of surface disturbance would occur at any one time, resulting in increased erosion rates until the areas are successfully reclaimed.

Up to 25.75 acres of vegetation would be removed at any given time. Community productivity would be altered until areas are successfully reclaimed. Because soil and climatic conditions for reclamation are poor, restoration of communities similar to predisturbance types may take many years.

Up to 13 acres of cryptogamic crust would be disturbed during the next 5 years. Soil stability would be lost until crust begin to reestablish; recovery to predisturbance levels may take from 40 to over 200 years.

Increased traffic on the county road and the presence of the mine would reduce the quality of experience for recreation users in the area.

The loss of an estimated 253 Wright fishhook cactus would occur due to the mine expansion.

Some additional emissions of total suspended particles, particulates less than 10 microns in size, sulfur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide, and volatile organic compounds would occur. National air quality standards would be met.

Wild horses would be temporarily displaced from approximately 2,500 acres surrounding the project area during mining operations.

4.82 No Action Alternative

Up to five acres of surface disturbance would occur at any one time, resulting in increased erosion rates until the areas are successfully reclaimed.

Up to five acres of vegetation would be removed at any given time. Community productivity would be altered until areas are successfully reclaimed. Because soil and climatic conditions for reclamation are poor, restoration of communities similar to predisturbance types may take many years.

Up to six acres of cryptogamic crust would be disturbed during the next five years. Soil stability would be lost until crusts begin to reestablish, so recovery to predisturbance levels may take from 40 to over 200 years.

Continued traffic on the county road and the continued presence of the mine would reduce the quality of experience of recreational users in the area.

The loss of an estimated 118 Wright fishhook cactus would occur due to mining.

The emissions of total suspended particles, particulates less than 10 microns in size, sulfur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide, and volatile organic compounds would continue to occur, although air quality standards would be met.

Wild horses would be temporarily displaced from approximately 2,300 acres surrounding the project area during mining operations.

5.0 Reasonably Foreseeable Development and Cumulative Impacts

5.1 Reasonably Foreseeable Development

Gypsum exploration and mining is occurring at five locations with the Price River/San Rafael Resource Area and, because there are abundant gypsum resources, future mine development and expansion is likely. Except for the Western Clay Company proposal, the Bureau of Land Management has not received any applications for new mines/mine expansions or rights-of-way in the immediate township, so the following discussion of reasonable foreseeable development is based on the apparent moderate level of interest in gypsum mining in the area. Therefore, reasonable foreseeable development would include expansion of existing mines in the Price River/San Rafael Resource Area.

Typically, mine development and expansion would occur in increments of 5-10 acres, and concurrently with reclamation of mined-out areas. Overall disturbance due to gypsum mining and access would gradually increase. Western Clay Company has additional claims adjacent to the project area, but it is unlikely that they would be developed in the reasonably foreseeable future.

5.2 Cumulative Impacts

Gypsum mining and rights-of-way for roads, pipelines, and power and telephone lines would likely continue to be two of the many uses with the San Rafael planning unit. Existing surface disturbance due to gypsum mining is 52.1 acres, while rights-of-way for roads in T.24S., R.7E., contain 9.3 acres. Existing mines include Gypsum Resource Development's Chalk Hills Mine at 4 acres, which is located east of Castle Dale. Georgia Pacific has a 26-acre mine just south of the Moore Road. The Sutherland Brothers' White Cloud Mine is just east of State Highway 24 and contains 1 acre of disturbance. Diamond K has 10 acres of disturbance at their BJ mine just south of the Moore Road. Western Clay Company has disturbed 4.95 acres at their Last Chance mine. Total existing disturbance due to gypsum activities is 52.1 acres. Georgia-Pacific Corporation proposes to add another 8 acres of disturbance to their mine, for a total of 34 acres. This proposed mine expansion, plus U.S. Gypsum Company's proposed mine and Georgia-Pacific Corporation's expansion would add 67.0-95.0 acres of disturbance. Therefore, cumulative impacts due to gypsum mining in the San Rafael planning unit would total 133.0-161.0 acres. This would represent a 102-144 percent increase in the area disturbed. The proposed right-of-way plus the right-of-way for U.S. Gypsum Company's mine would total 27.3 acres.

Approximately 316 Wright fishhook cactus would be disturbed by the Western Clay operation. The cactus would be transplanted as soon as possible, resulting in the survival of an estimated 20 percent or 63 of the plants. An estimated 253 plants would not survive the transplantation process. In addition, a seedbase for the cactus would be saved and spread over the reclaimed areas. The U. S. Gypsum operation would affect 25 cactus, which would be salvaged and used for scientific research. A total of 341 specimens of the Wright fishhook cactus would be disturbed by gypsum mining and related activity.

The disturbance of 67 to 95 additional acres due to gypsum mining would cause a small increase

in the soil-erosion rate. The amount lost would depend on the effectiveness of erosion-control measures and reclamation success. Most of the soil is expected to be contained onsite by the erosion-control measures.

Wild horses would be displaced by this operation and the U.S. Gypsum Company's Kimball Draw Mine to the east and concentrated into other portions of the MCHMA. The total area of displacement is estimated to be 7,500 acres, or less than 6 percent of the MCHMA.

The Western Clay Company and U.S. Gypsum Company operations could delay or preclude the option of Congress designating as wilderness 58.75 to 91.75 acres of land in HR1500 areas, which would be no more than 0.04 percent of the Devils Canyon and Muddy Creek HR1500 units.

Currently, there are ten acres of disturbance in VRM Class II (managed as Class I as called for by the San Rafael Resource Management Plan), 26 acres in Class II, 4 acres in Class III, and 5 acres in Class IV. The new mine and expansion would add 38 acres of disturbance in VRM Class II and 25.75 acres in VRM Class IV.

Currently, there are no more than 15 truck trips per day from existing mines. The Western Clay Company operation would add 3-10 truck trips per day and the U.S. Gypsum operation would add 3-25 truck trips. Total traffic would be 21-50 truck trips per day, 250 days per year. Total number of vehicles would be 42 to 100, 5 days per week. This would be an increase of 1.1-2.6 percent over existing traffic levels on a daily basis. This increase in traffic is not expected to appreciably add to the traffic on Interstate 70. The only existing public safety problem is the narrow county road north of Willow Springs, which is proposed to be widened by Sevier County. This would alleviate the safety problem.

6.0 References

Bureau of Land Management. 1984. Manual 9113-Roads. Engineering, Re. 90247. U.S. Department of the Interior, Bureau of Land Management.

___. 1986. National Environmental Policy Act Handbook, H-1790-1. U.S. Department of the Interior, Bureau of Land Management.

____. 1989. San Rafael Proposed Resource Management Plan/Final Environmental Impact Statement. Two volumes. U.S., Department of the Interior, Bureau of Land Management, Utah State Office, Moab District, San Rafael Resource Area.

___. 1991. Final Resource Management Plan. U.S. Department of the Interior, Bureau of Land Management, Utah State Office, Moab District, San Rafael Resource Area. May 1991. 106 pp. + appendixes.

Stokes, W.L. 1986. Geology of Utah. Utah Museum of Natural History and Utah Geological and Mineral Survey. 280 pp.

TRC Mariah Associates, Inc. 1997. Environmental Assessment UT-066-97-7, U.S. Gypsum San Rafael Quarry, Emery County, Utah. U.S. Bureau of Land Management, Moab District Office Price River/San Rafael Resource Area. August 1997.

Utah Department of Environmental Quality. 1985. Nonpoint Source Management Plan for hydrologic modifications to the Utah Nonpoint Source Management Plan. March 1995. 16 pp. + appendixes.

7.0 Consultation and Coordination

Tony Gallegos, Utah Division of Oil, Gas and Mining, was consulted regarding the plan of operations and bonding.

Bryant Anderson, Emery County, was consulted regarding the proposed action.

Larry England, U.S. Fish and Wildlife Service was consulted concerning the impacts to the endangered Wright fishhook cactus.

John Neil, Research Division, Utah Department of Transportation was consulted regarding noise restrictions.

Danny Washburn, Richfield Office, Utah Department of Transportation was consulted regarding traffic on Interstate 70.

Ray Petersen, Emery County Road Department was consulted regarding road maintenance on the county road.

Lyle Stott, Utah Department of Natural Resources, Division of Water Quality, was consulted regarding requirements on surface water discharges from mines and occurrence and impacts on groundwater resources.

A public comment period of 30 days was held. Four letters of comment were received and changes were made in the environmental assessment due to some of the comments (see Appendix E).

8.0 Appendixes

A. Plan of Operations - Western Clay Company
B. Checklist for Environmental Assessment
C. Monitoring Plan
D. Biological Opinion and Biological Assessment
E. Letters of Comment and Responses
F. Plant Species List
G. Animal Species List
H. Impact and Mitigation Summary
I. Map

Appendix A

4/6

WESTERN CLAY COMPANY
INDUSTRIAL / AGRICULTURAL MINERALS

M/015/072

SR / PR REC'D SEP 18 1997

Mr. NIEL A. SIMMONS
BLM MOAB DISTRICT
PRICE RIVER/SAN RAFAEL RESOURCE AREA
PO BOX 7004
PRICE, UT 84501

9/15/97

Dear Mr. Simmons:

Enclosed is a revised copy of the map for the Hebe (Lone Tree Wedge) Gypsum Mine. As you will see we have decreased the acreage to a total disturbance of 25.75 acres. The total disturbance for DOGM will be 32.92 acres as they consider the right of way as part of the mine area.

The estimate of acreage disturbed and reclaimed annually has also been changed. A new schedule has been included for your review. The estimate of tonnages by area has been modified to the following:

Estimates of tonnages by area:

Area A: 0 tons Seed-bed 53 tons Cryptogam 4,858 tons Overburden 27,180 tons Gypsum
Area B: 0 Seed-bed 12.0 Cryptogam 4,200 tons Overburden 30,900 tons Gypsum
Area C-1: 4.28 tons Seed-bed 57 tons Cryptogam 5,248 tons Overburden 64,211 tons Gypsum
Area C-2: 5 tons Seed-bed 112 tons Cryptogam 10,442 Overburden 127,208 tons Gypsum
Area D: .4 Tons Seed-bed 2.8 tons Cryptogam 0 tons Overburden 0 tons Gypsum
Area E: 12.38 tons Seed-bed 132 tons Cryptogam 16,170 tons Overburden 284,460 tons Gypsum

Annual amount of gypsum produced will be approximately 70,000 tons. Overburden produced per year will be approximately 5,000 tons. Seed bed approximately 2.62 tons per year and cryptogam approximately 70 tons per year.

Total number of acres disturbed has been modified to:

Operations Development Schedule:

Total number of acres disturbed:

Area A	2.62
Area B	2.22
Area C-1	2.82
Area C-2	5.79
Area D	0.69
Area E	10.86
Total	**25.75 acres**

Note: The State Of Utah Division Of Oil Gas and Mining considers the area covered

under the BLM right of way as disturbed under this plan. This right of way consists of 7.17 acres bringing the total to 32.92 acres.

Number of years for the mine: 5.00

The estimated yearly production rate is a minimum of: 35,000 tons. If known markets are capitalized upon yearly production of 100,000 tons is expected. Please note that as production increases the road and road surface will be improved to handle this traffic. At 100,000 tons per year it will take approximately 5 years to extract all the gypsum in this area. Total amount of resource expected to mined under this plan is approximately 534,000 tons.

Enclosed is our best estimate of a reclamation cost estimate for your review.

Thank you for your prompt attention to our application.

Sincerely;

Fred D. Mortensen

Fred D. Mortensen

P.O. Box 127, Aurora, Utah 84620 • OFFICE: (801) 529-3281 • PLANT: (801) 529-3445

WESTERN CLAY HEBE GYPSUM MINE SCHEDULE

RECLAMATION ESTIMATE PROPOSAL

AMOUNT OF DISTURBED AREA TO RECEIVE RECLAMATION	**32.92**	**ACRES**	**73096.09**
ESTIMATED TOTAL DISTURBED AREA	**32.92**	**ACRES**	
	32.92	**ACRES**	

ACTIVITY	QUANTITY	UNITS	$/UNIT	$	
SAFTEY SIGNS ETC	1	SUM	200	$200	N/C
EQUIPMENT REMOVAL	5	TRIPS	58	$290	N/C
DEBRIS REMOVAL	30	CY	6	$180	N/C
DEBRIS REMOVAL-LOADER	4	HRS	166	$664	N/C
DEBRIS REMOVAL-LABOR	8	HRS	32	$256	N/C
REGRADING FACILITIES	1	ACRE	496	$496	N/C
REPLACING OVERBURDEN	49,158	CY	0.31	$15,239	(1)
REGRADING FOR SOIL 50% OF AREA	16	ACRE	397	$6,535	(2)
RIPPING ACCESS ROADS-DOZER	3	ACR	347	$1,041	N/C
REPLACING SOIL ROADS-DOZER	3	ACR	397	$1,191	N/C
RIPPING ACCESS ROAD-ROW	7.20	ACR	544	$3,900	N/C
REGRADE ACCESS ROAD-ROW	7.20	ACR	397	$2,846	N/C
CACTI SURVEY	3	YEAR	500	$1,500	N/C
CACTI TRANSPLANTING	280	PLANT	16	$4,480	(2)
CACTI SEED HARVESTING	5	YEAR	1000	$5,000	N/C
CACTI STORAGE	2	YEAR	500	$1,000	N/C
CULVERT REMOVAL-WEST 42"	50	CY	3.06	$153	N/C
CULVERT REMOVAL-WEST 12"	8	CY	3.06	$24	N/C
CULVERT REMOVAL-EAST 36"	450	CY	3.4	$1,530	N/C
REPLACING CRYPTOGAM-SPREADER	2,000	CY	2.77	$5,540	(2)
BROADCAST SEEDING	3.70	ACRE	180	$666	(2)
DRILL SEEDING	22.00	ACRE	125	$2,750	(2)
DRILL SEEDING-ROW	7.20	ACRE	125	$896	N/C
GENERAL SITE CLEAN UP-40% OF AREA	13.17	ACRE	50	$659	(2)
EQUIPMENT MOBILIZATION-60 MILES	4	EQUIP	600	$2,400	N/C
SUPERVISION-1/2 OF TOTAL DAYS	6	DAYS	356	$2,136	(2)
		SUBTOTAL		$61,571	
10% CONTINGENCY				$6,157	
		SUBTOTAL		$67,728	
ESCALATE FOR 5 YEARS AT 2.52%				$8,975	
ROUNDED SURETY AMOUNT IN YR 2002-$				$76,703	
AVERAGE COST PER DISTURBED ACRE		$2,330			

	1	2	3	4	5
	$1,707	$1,750	$1,794	$1,839	$1,885
	$69,435	$71,185	$72,979	$74,818	$76,703

WESTERN CLAY HEBE GYPSUM MINE SCHEDULE

WITHOUT RIGHT OF WAY - BLM

YEAR	STAGE	ADJUSTED TOTAL	TOTAL DISTURBE	BEGIN DIST	TOTAL NEW	NEW ROAD	NEW MINE	RECLAIM NEW	RELEAS 3 YEARS	RELEAS 2YRS	RELEAS 1YR	RELEAS THIS YR
1996		4.95	4.95		4.95	0	4.95					
1997		4.95	4.95	4.95	0	0	0					
1997	NEW	9.95	9.95	4.95	5	0	5	1.64	1.64			
1998		14.95	14.95	9.95	5	0	5	5	5	1.64		
1999		19.95	19.95	14.95	5	0	5	5	5	5	1.64	
2000		24.11	25.75	19.95	5.8	0	5.8	5	5	5	5	1.64
2001	END	19.11	24.11	24.11	0	0	0	5	5	5	5	5
2002		14.11	19.11	19.11	0	0	0	4.11	4.11	5	5	5
2003		9.11	14.11	14.11	0	0	0	0	0	4.11	5	5
2004		4.11	9.11	9.11	0	0	0	0	0	0	4.11	5
2005	FINAL	(0.00)	4.11	4.11	0	0	0	0	0	0	0	4.11
2006		(0.00)	(0.00)	(0.00)	0	0	0	0	0	0	0	0
2007		(0.00)	(0.00)	(0.00)	0	0	0	0	0	0	0	0
2008		(0.00)	(0.00)	(0.00)	0	0	0	0	0	0	0	0
2009		(0.00)	(0.00)	(0.00)	0	0	0	0	0	0	0	0
2010		(0.00)	(0.00)	(0.00)	0	0	0	0	0	0	0	0
2011		(0.00)	(0.00)	(0.00)	0	0	0	0	0	0	0	0
2012		(0.00)	(0.00)	(0.00)	0	0	0	0	0	0	0	0
TOTALS					25.75	0	25.75	25.75	25.75	25.75	25.75	25.75

Appendix A

WESTERN CLAY COMPANY

INDUSTRIAL / AGRICULTURAL MINERALS

Mr. NIEL SIMMONS
BLM MOAB DISTRICT
PRICE RIVER/SAN RAFAEL RESOURCE AREA
PO BOX 7004
PRICE, UT 84501

12/11/96

Dear Mr. Simmons:

We are sending this letter to you in hopes of having it added to our recent application for a large mining plan on the Hebe Gypsum Claims we are leasing.

Please be advised that if any noxious weeds are encountered at any time during our operations we propose to remove them by grubbing. If it becomes necessary to use a herbicide we will do so after that herbicide has recommended to us in consultation with the proper BLM officials.

Thank you again for your prompt attention to our mine application.

Sincerely;

Wallace Curtis

P.O. Box 127, Aurora, Utah 84620 • OFFICE: (801) 529-3281 • PLANT: (801) 529-3445

WESTERN CLAY COMPANY

INDUSTRIAL/AGRICULTURAL MINERALS

96 DEC 11 AM 8:55

DEPT. OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BLM-Moab District
PO BOX 7004
Price, Ut 84501

12/10/96

Dear Mr. Simmons:

Thank you for your telephone call today. We are enclosing additional pages that represent additions to our mine plan submitted to your office on 12/6/96. Specifically we have included specific BLM serial numbers for each claim involved. There is also a statement regarding hazardous blasting agents, the no trespassing sign, and the road on the mine area.

We have also proposed a trial basis method for re-planting endangered cacti.

If you have any other suggestions or requirements please let us know.

Sincerely;

Wallace Curtis

USDI-BLM PRICE OFFICE
RECEIVED
DEC 11 '96

	INITIALS	DATE
MGR		
ASST MGR		
ASST MGR		
COAL		
MINERALS	Neil	
REC/CULT		
SUPPORT		
RANGELAND		
LANDS		
LAWENFORCE		
Geo Fratales		
COPY ALL EMP		
BOARD		

P.O. Box 127, Aurora, Utah 84620 • OFFICE: (801) 529-3281 • PLANT: (801) 529-3445

WESTERN CLAY COMPANY
INDUSTRIAL / AGRICULTURAL MINERALS

PROPOSAL TO BEGIN LARGE MINING OPERATIONS
ON THE HEBE GYPSUM MINE
1997-2008

PROPOSAL TO BUREAU OF LAND MANAGEMENT AND
STATE OF UTAH D.N.R DIVISION OF OIL GAS AND MINING

DECEMBER 6, 1996

Introduction

Western Clay Company has been in the business of processing industrial minerals for nearly 25 years. A significant percentage of this business is based on processing gypsum for various customers. In 1996 our largest customer opened their own processing plant and became our competitor. This action left Western Clay without any gypsum to process. To remedy the situation Western Clay has leased the Hebe gypsum claims from Garrick and Associates. As operator of these claims Western Clay hopes to market approximately 200,000 tons of gypsum per year for the next ten years. The following is our plan of operations submitted for your approval.

P.O. Box 127, Aurora, Utah 84620 • OFFICE: (801) 529-3281 • PLANT: (801) 529-3445

TABLE OF CONTENTS

BLM APPLICATION FORMAT

ut-060-38092-2
(August 1988)

(For BLM Use) Serial No._____

PLAN OF OPERATIONS
(For Operations Proposed Under the 43 CFR 3809 Regulations)

Operator Information:

Name	Address	Telephone
WESTERN CLAY CO (CORPORATION)	PO BOX 127 AURORA, UT 84620	801-529-3281

Company Representative:

Neal J. Mortensen
Secretary-Treasurer
PO Box 127
Aurora, Ut. 84620
801-529-3281

Claimant Information:

Name	Address	Telephone
Garrick & Associates	PO Box 570233, Sigurd, Ut 84657	801-896-1963
Associates:		
Neal J. Mortensen	405 S Main Central Valley, Ut.	801-896-6927
Fred D. Mortensen	420 S 100 W Salina, Ut 84654	801-529-3272
Garin Madsen	439 E 100 N Richfield UT 84701	801-896-6367
Alex Boyter	PO Box 570057 Sigurd, Ut 84657	801-896-6139
Jeff McClellan	246 N 400 W Richfield, Ut 84701	801-979-5799
Wallace Curtis	42 W Center Freemont, Ut 84747	801-979-5700
Eldred Garrick	5465 Fairoaks Dr. SLC Ut 84117	801-277-2282
Brad Boyter	PO Box 570233 Sigurd, Ut 84657	801-896-1963

Garrick and Associates has been given a copy of this application.
Western Clay has legal right to enter and conduct mining on these claims thru a lease with Garrick & Associates.

Claim Information (Claim names, circle claim types (Load, Placer, Mill Site, Tunnel)), BLM Serial Number:

Hebe 1	UMC#359456	placer claim
Hebe 2	UMC#359457	placer claim
Hebe 4	UMC#359459	placer claim
Hebe 5	UMC#359460	placer claim
Hebe 8	UMC#359462	placer claim

Location of Proposed Activity:

Hebe #1 S ½ of the S ½ of the SW 1/4 Sec 24 T24S R7E SLM
Hebe #2 N ½ of the NW 1/4 Sec 24 T 24S R7E SLM
Hebe #4 N ½ of the E ½ of the E ½ Sec 23T24SR7ESLM

The area of operations includes an existing pit area labeled areas A and B on the enclosed map. This pit was created under a notice of operations. See map for acreage.

The ownership of this land is public domain (BLM-Moab District, Price, Utah)

Describe existing disturbance and structures:

Existing disturbance on Hebe 8: At the northwest end of the present mining operation there is a disturbed area where equipment was parked and turned around. This area was previously disturbed by campers.

There are four wheeler tracks on the claim that were made by Western Clay and in the majority by re-creators who ride in this area.

There were two roads on the claims that existed prior to operations. The first road is now part of our haul road. The second road access from the north and follows the natural dike to a man-made pond that is situated in the western corner of area E. This road has been used by atv enthusiasts to access this area for recreation.

Estimated acreage disturbed and reclaimed annually:

1996 operations

Area A 2.62 acres
Area B 2.27 acres
Total area 4.89 acres

1997 operations

Area C 19.55 acres
Area D 3.50 acres
Road 1.27 acres
Area E1 9.09 acres
Total area 38.30 acres
1997 reclamation 8.00 acres
Total area 30.30

1998 operations

Reclaimed 8.00 acres
Total area 22.30 acres

1999 operations

Area C 9.21 acres
Area E 13.99 acres
Reclaimed 8.00 acres
Total area 37.50 acres

2000 operations

Reclaimed 8.00 acres
Total area 29.50 acres

2001 operations

Reclaimed 8.00 acres

Total Area 21.5 acres

2002 operations

Area C 11.40 acres

Area E 10.29 acres

Reclaimed 8.00 acres

Total area 35.19 acres

2003 operations

Reclaimed 8.00 acres

Total Area 27.19 acres

2004 operations

Area C 7.04 acres

Area E 9.01 acres

Reclaimed 8.00 acres

Total area 35.24 acres

2005 operations

Reclaimed 8.00 acres

Total area 27.24 acres

2006 operations

Reclaimed 8.72 acres

Total area 18.52 acres

2007 operations

Final reclamation 18.52 acres.

Estimates of tonnages by area:

Area A: 0 tons Seed-bed 32.75 tons Cryptogam 3,036 tons Overburden 16,988 tons Gypsum

Area B: 0 Seed-bed 12.0 Cryptogam 4,200 tons Overburden 30,900 tons Gypsum

Area C-1: 5.63 tons Seed-bed 74.49 tons Cryptogam 6,905.35 tons Overburden 84488.23 tons Gypsum

Area C-2:32.25 tons Seed-bed 747.68 tons Cryptogam 69,312.67 Overburden 848,053.44 tons Gypsum

Area D: 2.0 Tons Seed-bed 14.0 tons Cryptogam 0 tons Overburden 0 tons Gypsum

Area E: 37.50 tons Seed-bed 400 tons Cryptogam 49,000 tons Overburden 862,000 tons Gypsum

Estimates of annual amounts of gypsum and overburden produced:

Gypsum 200,000 tons per year
Overburden 14,800 tons per year
Seed-bed 7.5 tons per year
Cryptogam 200 tons

Proposed Operations:

Mining in all pits will be similar. Gypsum is exposed and visible on the proposed mine area and beds can be viewed in washes. Western Clay has also studied the geology of the area. Outcrop material has been tested and found to be high purity. Therefore, we do not believe an extensive drilling plan is necessary on any area except E.

The gypsum will be used for several purposes. Known and expected markets include agricultural gypsum and as an additive to white plaster. Other markets will be explored and developed. The gypsum will be processed at Western Clay's plant in Aurora Ut. Processing will include fine grinding and packaging for distribution. The plant and it's personnel have extensive experience in processing of gypsum.

Area C and Area E are on different beds of mineral. The bed exposed on area E is lower than that exposed on area C. This lower bed is slightly off color while the upper bed is whiter. The lower bed is flatter and more uniform which would make mining easier. Purity on the two beds is similar, however the trace amounts of metals in the two beds differ significantly. Most notable is that the lower bed has a lower concentration of Fluorine and Zinc. As one of our competitors is currently mining on this lower bed of gypsum it may become necessary to move to area E to compete. It is probable that markets will develop which would require mining of area C for one application and area E for another application.

The only **hazardous materials** used in the mining operation will be the fuel and oil used in the mining equipment. These materials will be properly handled and disposed of. Used oil will be taken to our recycling container at the plant in Aurora. A 500 gallon portable fuel tank is currently located near the existing pit in area A, in future stages this tank will be located in areas depicted by a triangle on the enclosed map titled **"Surface Facilities Map"** (p24). This tank will be located on the mine for its duration. We will construct a containment berm capable of handling a 500 gallon spillat each location.

Portable toilets, equipment and fuel tanks will be stored near the overburden piles in each stage. This is the same area as the fuel tank and is depicted by a triangle on the enclosed operations development map.

Any spills of petroleum products and or toxic substances will be cleaned up and contaminated soil taken to the East Carbon landfill where they have facilities to handle such materials. A berm large enough to contain a spill of the contents of the portable fuel tank will be constructed around the tank at each location of the tank. A trash barrel will be located near the

portable toilets and a frequent inspection of the disturbed area for the purpose of housekeeping will be conducted. This trash barrel will be emptied at the Sevier County Landfill.

The upper bed of gypsum is approximately 10 feet thick. The lower bed varies from 12 to 17 feet in thickness. Area C is on the upper bed, as is area A. Area E is on the lower bed. The gypsum which we wish to mine is covered with a thin layer of criptogamic soil which will be skimmed off and stored on the disturbed area. Overburden is for the most part only a few inches thick and will also be stored on the disturbed area. The above work will be completed utilizing a front end loader with some aid from a dozer. A backhoe or track-hoe without teeth will be used to remove overburden from gullies or depressed areas in the gypsum. A bobcat and a self propelled sweeper that retains its sweepings may also be used to gather criptogamic soil.

A portion of the mining will be done with a 650 type **reclaimer** as made by CMI Corporation of Oklahoma City. These machines make little dust. If dust becomes a problem they are equipped with a mist spray that can be utilized. The gypsum will be excavated in approximately six inch top size pieces. The reclaimer leaves the gypsum in a windrow where it will be gathered by a front end loader and stockpiled or loaded on a truck. The mining will be done in approximately 12 inch lifts.

The majority of the mining will be completed by **drilling and blasting** the gypsum. Drill holes will be made in the gypsum bed approximately five to eight feet apart. These holes will be drilled to a depth that will minimize the disturbance.

The blasting will be conducted utilizing dynamite and prell. Prell will be used sparingly so as to avoid the excessive scattering of material. The vast majority of primers will be of the non-electric variety. Blasting will be performed with adherence to proper safety measures by Western Clay employees with ten years of experience blasting minerals.

A truck mounted with a five inch auger drill will be used to bore shallow test holes in the pit area. The holes will be refilled with cuttings.

Posting of warning signs:

The following warning signs will be posted to minimize safety hazards to the public:

1. Upon entering mine access road there will be a 18" x 24" black and yellow sign "Dead End."
2. Upon entering mine access road will be a 18" x 24" black and yellow sign "Caution Haul Trucks."
3. Upon entering mine will be a 18" x 24" sign "NO TRESPASSING This property leased by Western Clay Co. Aurora, Ut. 801-529-3281."

Constructing berms, fences, etc. above high-walls:

A steel post and barb wire fence will be erected around high-walls. On any elevated work area where machinery is operated there will be a berm around the high-wall edge to meet msha standards.

The following equipment may be used in the mining on this deposit:

Re-claimer, Backhoe, Track-hoe, Front End Loader, Bulldozer, Water Truck, Road Grader, Pickup Trucks, Ten Wheel Trucks, Diesel Tractors with belly dump or end dump style trailers, Drill Truck, Portable crushing and screening equipment, Portable toilets, Portable fuel tank.

Criptogamic soil and overburden, mostly blow sand, will be piled separately on disturbed areas. Any stockpiled cryptogam, topsoil, etc. will be wetted to minimize water and wind erosion. The natural tendency of the material is to form a crust when wetted. If this measure proves inadequate we will apply a tackifier recommended by the BLM. We will also place piles on slightly elevated areas to minimize water erosion. Once an area has been mined out the overburden will be placed over the disturbed area. Drainage will be reestablished to resemble natural drainage. **(Illustration on page 31).** Topsoil and criptogamic soil will also be reapplied. The reclaimed areas will be seeded. A seed-bed will be prepared on reclaimed areas and proper seeds will be planted according to procedures acceptable to the BLM.

Please note that the same stockpiles will be used for areas C-1 and C-2.

Endangered Cacti. Each cactus disturbed along with two inches of the topsoil within a 1 meter diameter of the cactus will be gathered for seed-bed material. This seed-bed material will be stockpiled seperatly near each Cryptogam soil pile. These materials will be used to re-seed the cacti upon reclamation. An extensive and inclusive inventory of all cacti to be disturbed will be conducted prior to disturbance.

No **drill holes** will be made deeper than 25 feet. These drill holes will come nowhere near the watertable. Holes will be made for testing of known bed, not exploration. Therefore, after mining the holes will no longer exist. If for some unforseen reason a drill hole is left it will be plugged per DOGM rules of reclamation.

The route to be used by the haul trucks will be the Freemont Junction Interchange. Eventually this route may be changed to the Ivie Creek-Muddy Creek Interchange. The haul distance to our Aurora plant is 60 miles on both routes, however the Ivie route has fewer miles of off-highway travel and would therefore be more economical for truck haulage.

The estimated yearly production rate is a minimum of: 35,000 tons. If known markets are capitalized upon yearly production of 200,000 tons is expected. Please note that as production increases the road and road surface will be improved to handle this traffic. At 110,000 tons per year it will take 10 years to extract all the gypsum in this area.
Total amount of resource expected to mined under this plan is approximately 1,100,000 tons.

Maximum Number of personnel needed to run the mine:

Mine workers:	1-4 operators
	1 quality control supervisor
	1 water truck driver
Truck Drivers:	8-10
Contractors:	0-2
Support Personnel in Aurora:	15-20

In order to insure safety at least two persons will be present at the mine during operations.

Size and number of trucks to be used:

6 to 10- 32 ton trucks

Number of trips these trucks will make on a daily basis: 2

Number of trucks and frequency of trips will increase as tonnage increases. The trucks used will be the most economical companies, drivers, and equipment that can be located.

Access Roads:

All access roads will be built in accordance with BLM Class II road standards and will be improved, subject to approval, as production increases. When possible trucking will be scheduled when there is natural moisture on the road. Dust control on access roads will be handled by a Water truck. In dust prone areas of the road gravel will be laid down. Approximately 4,000 Gallons of water each 2 ½ hours can be applied as needed. This water will be obtained from three main sources:

1. Lone tree crossing of the Muddy river.
2. Hauled from the Sevier Valley.
3. Hauled from Huntington by Nielsen Construction.

The **access road** to the mine is covered under the BLM Right of Way Serial #UTU-73237.

Period of Operation:

From 1996 to 2007

Mining will be conducted periodically throughout the year. At the end blasting a large stockpile will remain. This stockpile will then be hauled away. Before the stockpile is depleted

mining will start again. If overburden and topsoil piles remain in place for more than a year they will be seeded. Overburden piles will contain some gypsum which should allow them to crust when wetted. This crusting will help prevent dust lost.

Operations Development Schedule:

Total number of acres disturbed:

Area A	1.64
Area B	2.22
Area C-1	3.73
Area C-2	37.44
Area D	3.50
Area E	32.97
Total	**81.50 acres**

Note: The State Of Utah Division Of Oil Gas and Mining considers the area covered under the BLM right of way as disturbed under this plan. This right of way consists of 7.17 acres bringing the total to 88.67 acres.

Number of years for the mine: 11.00

Drainages:

The natural contour of this area is flat with few gullies. The east half of area C will drain to the east and the west half will drain to the west. Areas A and B will drain to the west. Area D will drain towards the low water crossing. The east half of area E will drain to the east and the west half will drain to the west.

Erosion control measures are shown in the boulder fill and culvert on the enclosed map. Upon reclamation a hard floor will exist at the bottom of the pit area. Small hills and valleys will be constructed to restore natural drainage and appearances. The floor of the pit will gently slope to the south to facilitate drainage, erosion should not be a problem.

On cross section A-A a 60 foot long 36 inch diameter pipe will be installed. The culvert will be placed on no more than a 3% slope the upper end will start at the existing gully bottom and will be bedded and compacted. In putting down the culvert some material will be pushed downstream and out of our mining area in order to prevent an impoundment of water. At the end of the culvert we will place non-soluble boulders to slow the flow of water and to prevent erosion.

The road in area D will cross through the channel. The dam will be elminated and the material it was constructed with will be used for the fill in this low water crossing. By eliminating this damn the area can be returned to a more natural state than if the pond were left in place. If the BLM finds that they still wish to maintain a pond in this area Western will incize a pond upon reclamation for use by wild animals and range stock that would last longer and have a more natural appearance than a damned pond would. As soon as road construction through area D is completed it will be immediately reclaimed, excluding the road.

Proposed Reclamation:

When an area has been mined out there will be a pit area remaining with a depth of approximately 12 feet. For reclamation, material from the bottom of the pit may be needed to create the sloped sides as required by the BLM and DOGM. Overburden that has been stored will be placed on the disturbed area. The criptogamic soil will then be distributed over the surface. Seeds will be planted as required by the BLM . Stockpiles will be backfilled and graded to resemble natural contours. All overburden, Cryptogam, sub-grade gypsum, and seed-bed material will be transported with a front end loader and spread with a mechanical spreader. As soon as an area is available for reclamation reclamation will begin and will continue concurrently as mining progresses.

Reclamation Cost Estimate.

Clean up	$600
Backfilling, grading, and contouring	$18,000
Soil re-distribution and stabilization	$9,000
Re-vegetation	$3,000
Cost estimate	$30,000

Reclaimed surfaces will be watered. Gypsum in the soil forms a natural crust when wetted. This crust will prevent wind loss of the seed-bed and topsoil.

Drainage will be restored to a functional and natural appearing state. Cryptogam soil will be reapplied after mining.

Any drill holes not mined through at the end of operations will be properly plugged.

All compacted areas such as roads, pads, and pit floors will be ripped to a minimum depth of 12 inches prior to replacing overburden or soils. All regraded slopes will be at an angle of 3H:1V or less, prior to the placement of overburden or topsoil material. On reclamation all water crossings will be restored to approximate natural condition.

All mining features at this sight will be reclaimed.

Current land uses other than mining.

There is a small amount of recreation in the area. Most of this activity is conducted by ATV enthusiasts. There are also ranchers who use this area as a part of their rangeland.

Disposal of trash.

No buildings or foundations will be built other than the containment berm for the fuel tank. This berm and all other trash will be removed from public lands upon reclamation. Housekeeping will be maintained and any trash collected will be taken to an approved landfill for disposal.

Topsoil redistribution. All overburden replacement and regrading will be completed before cryptogram is replaced. The final reclaimed surface will be left in a roughened condition to promote water retention for plant use.

Seeds will be broadcast over cryptogamic material and cacti seed-bed. A small motorized vehicle will drag a harrow over the area to spread and cover the seeds and to leave the bed in a roughened condition to minimize erosion. Seeds will be spread using the broadcast method.

If fertilizer is reccomended by the BLM that reccomendation will be followed.

I will complete all necessary reclamation of areas disturbed during the course of my operations to the standards described in 43 CFR3809.1-3(d) and that reasonable measures will be taken to prevent unnecessary or undue degradation of the federal lands during operations.

Signature Fred D. Mortensen
Fred D. Mortensen, President
Western Clay Company

	NEW ROAD	NEW MINE	NEW RECLAIM	RELEASED RECLAIM	TOTAL DISTURBED
1997	4.72	10.78	1.64		15.5
1998		9	2.83		24.5
1999		8.69	5.91		33.19
2000		10	13.88		43.19
2001		5	0		48.19
2002		4.22	13.36	1.64	50.77
2003		8.97	9.21	2.83	56.91
2004		6	0	5.91	57
2005		5.09	6.08	13.88	48.21
2006		4.91	8.17	0	53.12
2007		4.12	0	13.36	43.88
2008			20.42	9.21	34.67
2009				0	34.67
2010				6.08	28.59
2011				8.17	20.42
2012				0	20.42
2013				20.42	0
TOTAL	**4.72**	**76.78**	**81.5**	**81.5**	

NOTE ALL RECLAMATION WILL BE DONE IN THE FALL OF THE YEAR. CHART ASSUMES RECLAMATION COMPLETED AT THE END OF THE YEAR.

DIVISION OF OIL GAS AND MINING APPLICATION FORMAT

FORM MR-LMO (COPIED)
(REVISED 1/92)

FOR DIVISION USE ONLY
File #: M /_____/_____

Date Approved:_____/____/_____

DOGM Lead:_____

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
Telephone: (801-538-5340

NOTICE OF INTENTION TO COMMENCE LARGE MINING OPERATIONS

GENERAL INFORMATION (Rule R647-4-104)

1. **Mine Name**: HEBE

2. **Name of Applicant Company**: Western Clay Company
   Western Clay is a Corporation

3. **Permanent Address**: Western Clay Company
   PO Box 127
   Aurora, Ut. 84620

4. **Company Representative**: Neal J. Mortensen
   Secretary-Treasurer
   PO Box 127
   Aurora, Ut. 84620

5. **Location of Operation**

HEBE 1: S ½ OF THE S ½ OF SW 1/4	SEC 13 T24S R7E SLM
HEBE 2: N ½ OF THE NW 1/4	SEC 24 T24S R7E SLM
HEBE 4: N ½ OF THE E ½ OF THE E ½	SEC 23 T24S R7E SLM
HEBE 5: N ½ OF THE W ½ OF THE E ½	SEC 23 T24S R7E SLM
HEBE 8: N ½ OF THE E ½ OF THE W ½	SEC 23 T24S R7E SLM
HEBE 9: N ½ OF THE S ½	SEC 15 T24S R7E SLM
HEBE 10:SE ½ OF THE S 1/4	SEC 15 T24S R7E SLM
SW ½ OF THE SW 1/4	SEC 14 T24S R7E SLM
HEBE 11:NW 1/4 OF THE NW 1/4	SEC 23 T24S R7E SLM

6. **Ownership of Land Surface:**
Public Domain (BLM) Moab district
125 S 6th W
Price, Ut 84501

7. **Owners of record of the minerals to be mined:**

Name	Address	Telephone
Garrick & Associates	PO Box 570233, Sigurd, Ut 84657	801-896-1963
Associates:		
Neal J. Mortensen	405 S Main Central Valley, Ut.	801-896-6927
Fred D. Mortensen	420 S 100 W Salina, Ut 84654	801-529-3272
Garin Madsen	439 E 100 N Richfield UT 84701	801-896-6367
Alex Boyter	PO Box 570057 Sigurd, Ut 84657	801-896-6139
Jeff McClellan	246 N 400 W Richfield, Ut 84701	801-979-5799
Wallace Curtis	42 W Center Freemont, Ut 84747	801-979-5700
Eldred Garrick	5465 Fairoaks Dr. SLC Ut 84117	801-277-2282
Brad Boyter	PO Box 570233 Sigurd, Ut 84657	801-896-1963

8. **The above owners have been notified in writing.**

9. **Western Clay has the legal right to enter and conduct mining operations on the land covered by this notice.**

MAPS DRAWINGS AND PHOTOGRAPHS (Rule R647-4-105)

1. **Base map (page 38)**
Included with this application is a complete and correct topographic base map with appropriate contour intervals which shows all of the items on the following list. The scale is 1 inch = 2,000 feet (preferably a USGS 7.5 minute series or equivalent topographic map) showing [illegible] to be affected in sufficient detail to permit calculation of [illegible]

Map Checklist
Check off each section as it is drawn on the map.

A. Property boundaries of surface ownership — All surface owned by BLM Except portion of road in Section 16 which is a state Section.

B. Streams, springs, other bodies of water, roads, buildings, strips, electric lines, pipelines, any other existing surface or subsurface facilities within 500 feet of the proposed mining operations — x

C. Proposed route of access to the mining operations from nearest publicly maintained highway (map scale appropriate to show access) — See map on page 37

D. Known areas which have been previously impacted by mining or exploration activities within proposed area — X

E. Acreage proposed to be disturbed or reclaimed each year — x

2. **Surface Facilities Map** (page 24)
A surface facilities map of not less scale than 1" = 500'.
Map checklist
Check off each section as it is drawn on the map.

A. Proposed surface facilities, including but not limited to buildings, stationary equipment, roads, utilities, power lines, drainage control structures, topsoil storage areas, overburden storage areas, any waste facilities, etc. — X

B. A border clearly outlining the extent of the surface disturbed area proposed to be affected by mining and the number of acres proposed to be affected — x

C. The location of known test holes, pits, etc — x

OPERATION PLAN (Rule R647-4-106)

1. **Mineral to be mined** is Gypsum.

2. **Acreage to be disturbed:**

Mine-site	81.50 acres
Access-Haul roads	07.17 acres
Facilities	00.00 acres
Total:	88.67 acres

3. **Describe methods and procedures to be employed for mining, on-site processing and concurrent reclamation.**

During operations, disturbed areas will be reclaimed when no longer needed. All disturbed areas that are not curently utilized will be kept in a safe and environmentally stable condition.

Mining in all pits will be similar. Gypsum is exposed and visible on the proposed mine area and beds can be viewed in washes. Western Clay has also studied the geology of the area. Outcrop material has been tested and found to be high purity. Therefore we do not believe an extensive drilling plan is necessary on any area except E.

The gypsum will be used for several purposes. Known and expected markets include agricultural gypsum and as an additive to white plaster. Other markets will be explored and developed. The gypsum will be processed at Western Clay's plant in Aurora Ut. Processing will include fine grinding and packaging for distribution. The plant and it's personnel have extensive experience in processing of gypsum.

Area C and Area E are on different beds of mineral. The bed exposed on area E is lower than that exposed on area C. This lower bed is slightly off color while the upper bed is whiter. The lower bed is flatter and more uniform which would make mining easier. Purity on the two beds is similar, however the trace amounts of metals in the two beds differ significantly. Most notable is that the lower bed has a lower concentration of Fluorine and Zinc. As one of our competitors is currently mining on this lower bed of gypsum it may become necessary to move to area E to compete. It is probable that markets will develop which would require mining of area C for one application and area E for another application.

The gypsum which we wish to mine is covered with a thin layer of cryptogam soil which will be skimmed off and stored on the disturbed area. Overburden is for the most part only a few inches thick and will also be stored on the disturbed area. The above work will be completed utilizing a front end loader with some aid from a dozer. A backhoe or track-hoe without teeth will be used to remove overburden from gullies or depressed areas in the gypsum. A bobcat and a self propelled sweeper that retains its sweepings may also be used to gather cryptogam soil.

A portion of the mining will be done with a 650 type **reclaimer** as made by CMI Corporation of Oklahoma City. These machines make little dust. If dust becomes a problem they are equipped with a mist spray that can be utilized. The gypsum will be excavated in approximately six inch top size pieces. The reclaimer leaves the gypsum in a windrow where it will be gathered by a front end loader and stockpiled or loaded on a truck. The mining will be done in approximately 12 inch lifts.

The majority of the mining will be completed by **drilling and blasting** the gypsum. Drill holes will be made in the gypsum bed approximately five to eight feet apart. These holes will be drilled to a depth that will minimize the disturbance.

The blasting will be conducted utilizing dynamite and prell. Prell will be used sparingly so as to avoid the excessive scattering of material. The vast majority of primers will be of the non-electric variety. Blasting will be performed with adherence to proper safety measures by Western Clay employees with ten years of experience blasting minerals.

A truck mounted with a five inch auger drill will be used to bore shallow test holes in the pit area. The holes will be refilled with cuttings.

The following warning signs will be posted to minimize safety hazards to the public:

1. Upon entering mine access road there will be a 18" x 24" black and yellow sign "Dead End."
2. Upon entering mine access road will be a 18" x 24" black and yellow sign "Caution Haul Trucks."
3. Upon entering mine will be a 18" x 24" sign "NO TRESPASSING This property leased by Western Clay Co. Aurora, Ut. 801-529-3281."

A steel post and barb wire fence will be erected around high-walls. On any elevated work area where machinery is operated there will be a berm around the high-wall edge to meet MSH standards.

The following equipment may be used in the mining on this deposit:
Backhoe, Track-hoe, Front End Loader, Bulldozer, Water Truck, Road Grader, Pickup Trucks, Ten Wheel Trucks, Diesel Tractors with belly dump or end dump style trailers, Drill Truck, Portable crushing and screening equipment, Portable toilets, Portable fuel tank.

4. **Elevation of groundwater is unknown.**

5. **Thickness of soil material is approximately 1 inch.** 1 inches
   Area from which soil material can be salvaged 80.00 acres
   Volume of soil to be stockpiled 387,200 cu. Yards

6. **Thickness of overburden** averages 1.00 feet. Ranges from 1-34 feet.

7. **Thickness of mineral deposit:**
   Upper Bed Areas A, B, C is 8 to 20 ft. AVG 8.00 feet
   Lower Bed on Area E is 10 to 17 ft AVG 10.00 feet.

8. Volume of refuse, tailings and processing waste stockpiles will be -0- cu yards.

9. There will be no tailings ponds or water storage ponds constructed on this mine.

10. **Describe how topsoil or subsoil material will be removed, stockpiled, and protected:**
The gypsum which we wish to mine is covered with a thin layer of Cryptogamia soil which will be skimmed off and stored on the disturbed area. Overburden is for the most part only a few inches thick and will also be stored on the disturbed area. The above work will be completed utilizing a front end loader with some aid from a dozer. A backhoe or track-hoe without teeth will be used to remove overburden from gullies or depressed areas in the gypsum. A bobcat and a self propelled sweeper that retains its sweepings may also be used to gather Cryptogamia.

Cryptogamia and overburden, mostly blow sand, will be piled separately on disturbed areas. Any stockpiled cryptogam, topsoil, etc. will be wetted to minimize water and wind erosion. The natural tendency of the material is to form a crust when wetted. If this measure proves inadequate we will apply a tackifier recommended by the BLM. We will also place piles on slightly elevated areas to minimize water erosion. Once an area has been mined out the overburden will be placed over the disturbed area. Drainage will be reestablished to resemble natural drainage. **(Illustration on page 31).** Topsoil and Cryptogamia will also be reapplied. The reclaimed areas will be seeded. A seed-bed will be prepared on reclaimed areas and proper seeds will be planted according to procedures acceptable to the BLM.

Endangered Cacti. Each cactus disturbed along with two inches of the topsoil within a 1 meter diameter of the cactus will be gathered for seed-bed material. This seed-bed material will be stockpiled near each Cryptogam pile. These materials will be used to re-seed the cacti upon reclamation. An extensive and inclusive inventory of all cacti to be disturbed will be conducted prior to disturbance.

11. **Describe how overburden how overburden material will be removed, stockpiled and protected.**
The gypsum which we wish to mine is covered with a thin layer of Cryptogamia soil which will be skimmed off and stored on the disturbed area. Overburden is for the most part only a few inches thick and will also be stored on the disturbed area. The above work will be completed utilizing a front end loader with some aid from a dozer. A

backhoe or track-hoe without teeth will be used to remove overburden from gullies or depressed areas in the gypsum.

12. **Describe how tailings, waste rock, rejected materials, etc. will be disposed of:**
Any sub-grade mineral will be piled with the overburden piles and spread over the mine during reclamation.

13. **Potentially deleterious materials must be analyzed for toxicity. Describe the nature of any deleterious materials which will be used, encountered, or generated onsite. (See rule R647-1-004):**
None.

14. **For each tailings pond, sediment pond, or other major drainage control structures, attach design drawings and typical cross-sections.**
See attachments # on page 32-33

15. **Describe any proposed effluent discharge points (UPDES) and show their location on the map provided under rule R647-4-105.2. Give the proposed discharge rate and expected water quality. Attach chemical analyses of such discharge if available.**
No waste water will be generated.

16. **Vegetation**-The operator is required to return the land to a useful condition and reestablish at least 70 percent of the pre-mining vegetation ground cover.
The following information is based on a vegetation survey conducted by Environmental Industrial Services. A copy of that survey is attachment #

A. Sampling method used was the line intercept point method.
Number of transects: **53**

Ground cover	
Vegetation	06.72%
Litter	06.72%
Rock	00.75%
Bare Ground	85.81%
	100.00%

The four predominant perennial species of vegetation growing on the area.
1. Atriplex Corrugata
2. Chrysothomaus Nauseosus
3. Ephedra Torreyanna
4. Oryzopsis hymenoides

B. **Photographs:** The operator will submit photographs of the site sufficient to show existing vegetation conditions. These photographs will show the general appearance and condition of the area to be affected and may be utilized for

comparison upon reclamation of the site. Photographs will be clearly marked as to location, orientation and date that the pictures were taken.
See attachment (page 34).

17. **Soils** The plan shall include an order 3 soil survey map, however due to the poor nature and negligible amount of soil no order 3 maps are available. **Soils** in this area are negligible and poor. Some of the area is topped with blow-sand or cryptogam. The remainder of the area is exposed shale or gypsum sometimes capped with cryptogam. **For analysis of soils see EIS soil survey attachment #:**

18. **Provide a narrative description of the geology of the area and a geologic cross section:**
Narrative description of the areas geology. Gypsum beds dip gently to the west. We are proposing operations on both an upper and a lower bed of gypsum. The upper bed is on area C and the lower bed on area E.

IMPACT ASSESSMENT

Please provide a general narrative description identifying potential surface and or subsurface impacts. Where applicable, this description should include surface and groundwater systems, threatened or endangered species or their critical habitats, existing soil resources for reclamation, slope stability, erosion control, air quality, and public health and safety.
Impact assessment. The ground water in this area is very deep and should not be impacted in any way by our operations. There are endangered cacti in the area of our operations, but after consultation with BLM and Wildlife personnel it has been determined that we will collect the plants and the area surrounding the plants. This material will be stockpiled and the endangered cacti will be re-seeded upon reclamation of this area. There will be a minimum impact on air quality at this operation. Reclaimers can be equipped with water jets to minimize what little dust they create. When possible, trucking will be scheduled for periods when roads have been wetted by natural moisture. A water truck may also be used to reduce dust made by haul trucks. Warning signs have been posted, berms and fences will be installed, and other prudent measures will be undertaken as suggested or conceived to ensure public safety.

RECLAMATION PLAN (Rule R647-4-110)

1. **Current land uses other than mining:**
   Small amount of ATV traffic
   BLM Rangeland
2. **List future post-reclamation land use proposed:**
   BLM Rangeland.

3. **Describe each phase of reclamation of the mine-site in detail under the following categories:**

Reclamation of all phases will be similar.

A. Disposal of Trash

Describe how buildings, foundations and other waste materials will be disposed of.

No buildings or foundations will be built. The berm around the fuel tank will be removed from public lands on reclamation. The small amount of trash and other waste materials generated will be collected and taken to a landfill.

B. Backfilling and grading

Describe equipment and methods employed, amount of materials to be moved and final disposition of any stockpiled material.

On reclamation any hard surfaces will be ripped to a minimum depth of twelve inches with a dozer. A loader will be used to transfer the stockpiled overburden and sub-grade gypsum onto the area to be reclaimed or onto a truck which will then place the material on the area to be reclaimed. A dozer and road grader will be used to spread this material over the surface area restoring the area to its approximate natural contours. This area will be left in a roughened condition so as to give seed-bed and cryptogam material a chance to adhere.

C. Soil Material Replacement

In order to reestablish the required ground cover, one to two feet of suitable soil material usually has to be redistributed on the areas to be re-seeded. If the stockpiled soil is not sufficient for this soil borrow areas will need to be located.

Soil material to be put on area to be re-seeded is approx 1 inch.

Where will this material come from?

This material will come first from all overburden piles. The next layer will be cacti seed-bed and the final layer will be the cryptogam material.

How will it be transported and spread?

The soil materials will be transported with a front end loader and sometimes with a truck. The overburden material will be spread with a dozer and a grader. The seed-bed cacti and cryptogam will be spread with a mechanical spreader.

D. Seed-bed preparation

Describe how seed-bed will be prepared and equipment to be used.

Seed-bed will be ripped to a minimum depth of six inches using a dozer and possibly with the aid of a disc.

E. Seed Mixture-List the species to be seeded:

This seed mix was reccomended by BLM for Right of way if another mix is deemed more appropriate by BLM in the future that mix will be used.

Species name Seeding Rate(Lbs/live seed acre)

Ephedra torreyana	2.00
Kochia prostrata	2.00
Melilotus officinalis	2.00
Oryzopsis hymenoides	4.00
Hilaria jamesii	4.00
Total	14.00

(DOGM recommends seeding 20 lbs/acre of native and introduced adaptable species of grass, forb, and browse seed)

F. Seeding method

Describe method of planting the seed.

Broadcast method. Seed will be harrowed or raked 1/4 to ½ inch into the soil. Best attempts will be made to seed in the fall as this is the preferred time to seed.

G. Fertilization

As reccomended by BLM.

H. Other Re-vegetation Procedures

As reccomended by BLM.

VARIANCE (Rule R647-4-112)

Any planned deviations from rule R647-4-007 (operating practices), R647-4-108 (hole plugging requirements), or Rule R647-4-111 (Reclamation Practices) must be identified below.

NO VARIANCES PLANED OR PREDICTED.

SURETY (Rule R647-4-113)

A reclamation surety must be provided to the division prior to final approval of this application. In calculating this amount the division will consider the following major steps:

1) Clean up and removal of structures.
2) Backfilling grading and contouring
3) Soil material redistribution and stabilization
4) Re-vegetation (preparation, seeding, mulching)

To assist the Division in determining a reasonable surety amount there is here given a reclamation cost estimate:

Reclamation Cost Estimate.

Clean up	$600
Backfilling, grading, and contouring	$18,000
Soil re-distribution and stabilization	$9,000
Re-vegetation	$3,000
Cost estimate	$30,000

SIGNATURE REQUIREMENT

I hereby certify that the foregoing is true and correct.

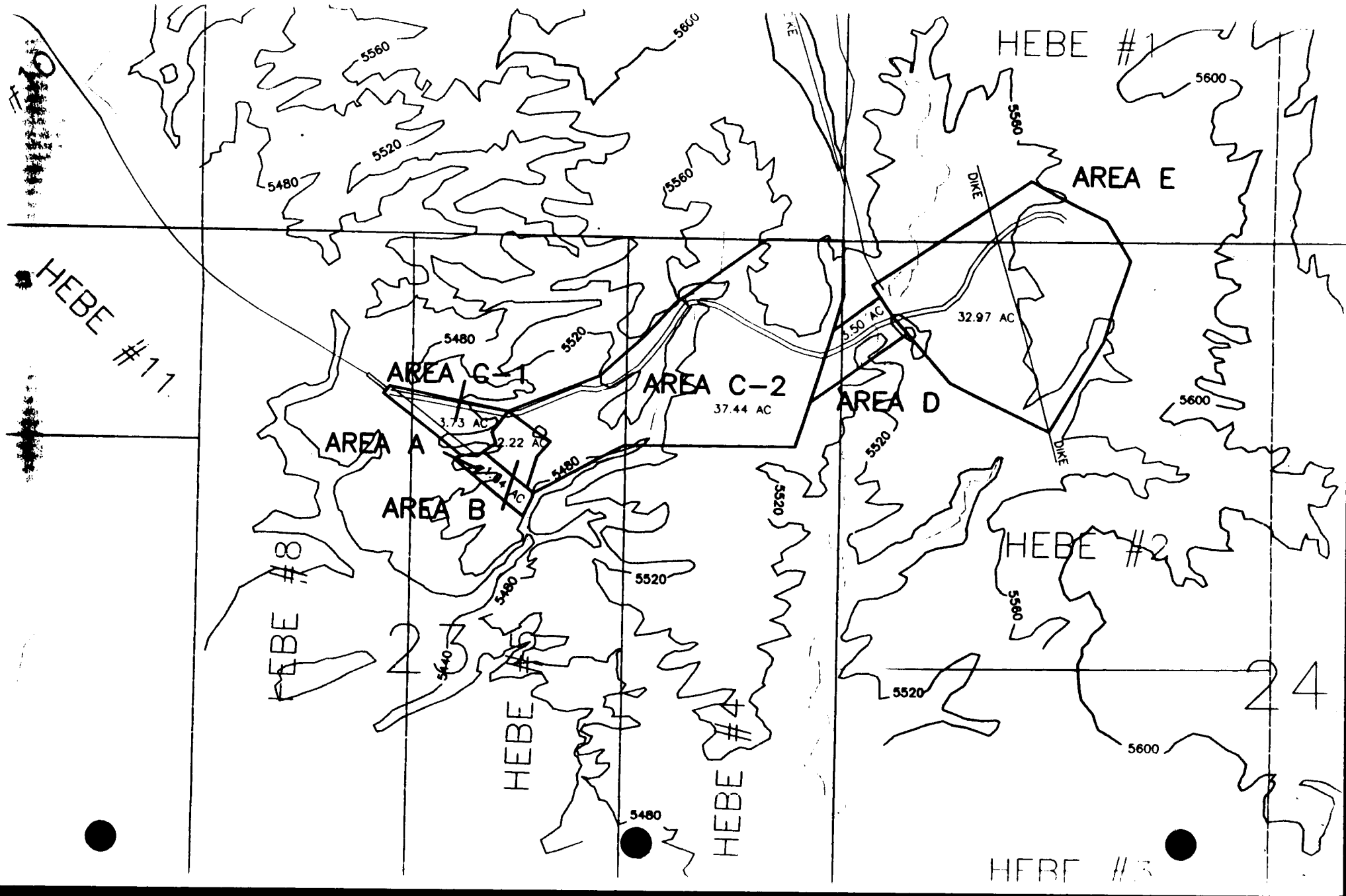
Signature of operator: Fred D. Mortensen

Name Fred D. Mortensen

Title President- Western Clay Company

Date 12-10-96

There is no confidential information enclosed.


HEBE #1
HEBE #11
HEBE #8
HEBE #7
HEBE #4
HEBE #2
HEBE #3
AREA A
AREA B
AREA C-1
AREA C-2
AREA D
AREA E
3.73 AC
2.22 AC
1.14 AC
37.44 AC
3.50 AC
32.97 AC
DIKE
DIKE
5600
5560
5520
5480
5440
5480
5520
5560
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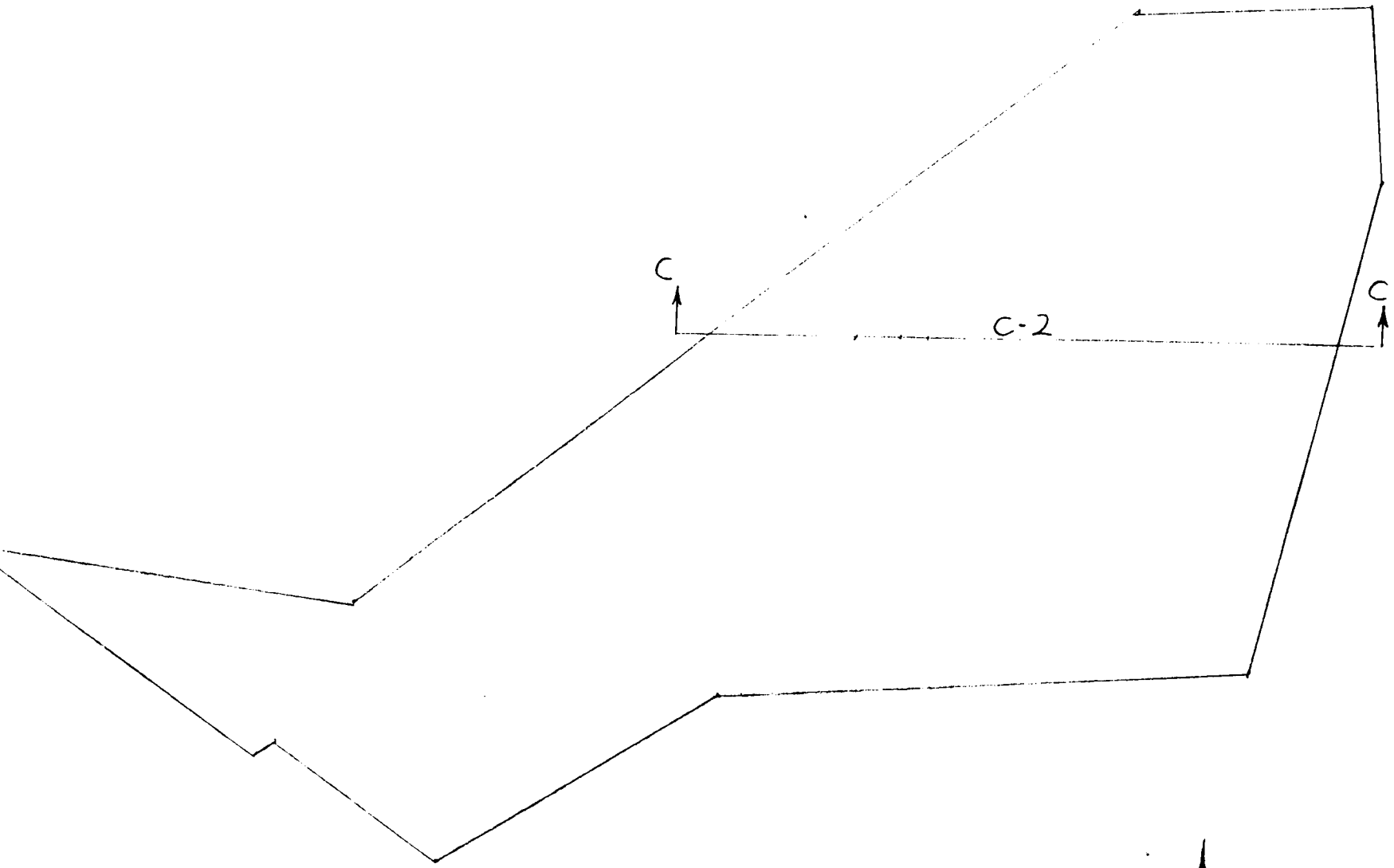
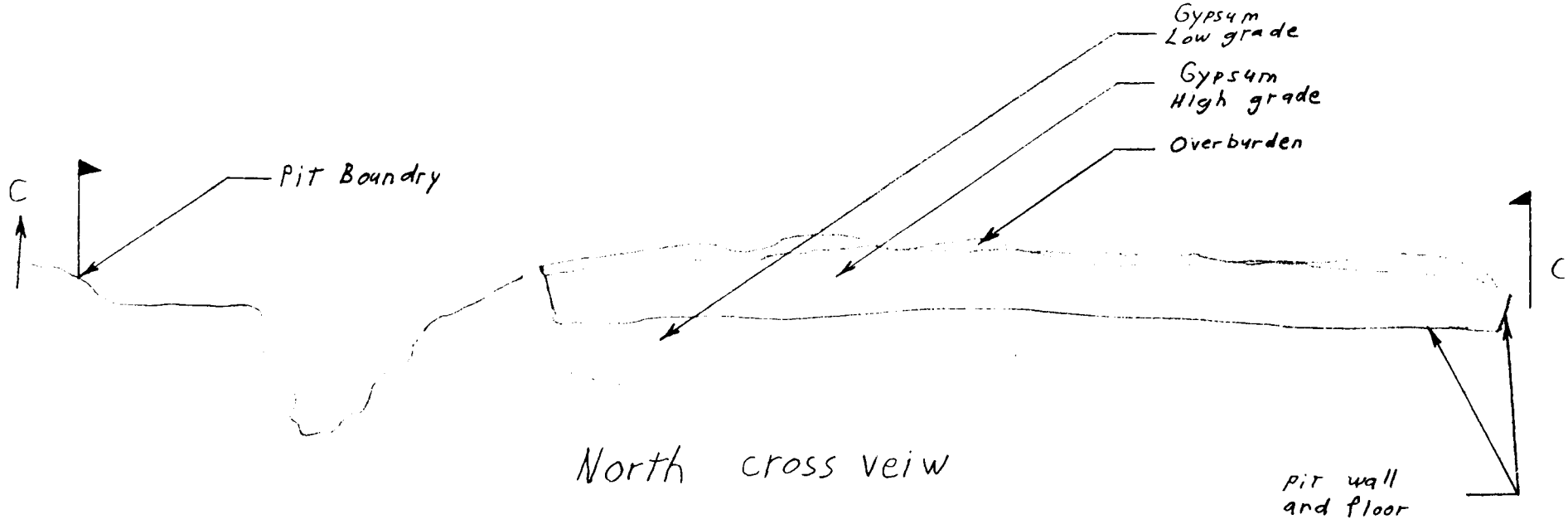
5480
24

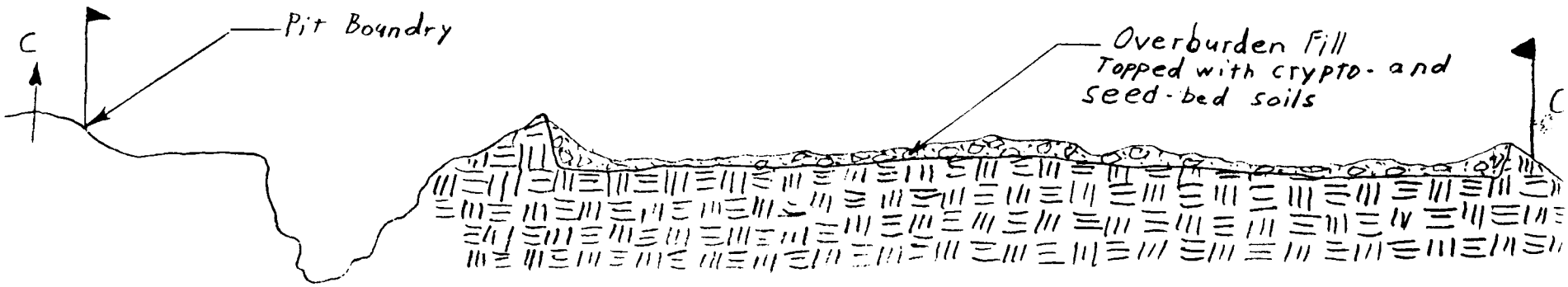
CROSS SECTION OF GYPSUM PIT AREA PRIOR TO MINING



C-2 AREA - C cross section plan view
No scale

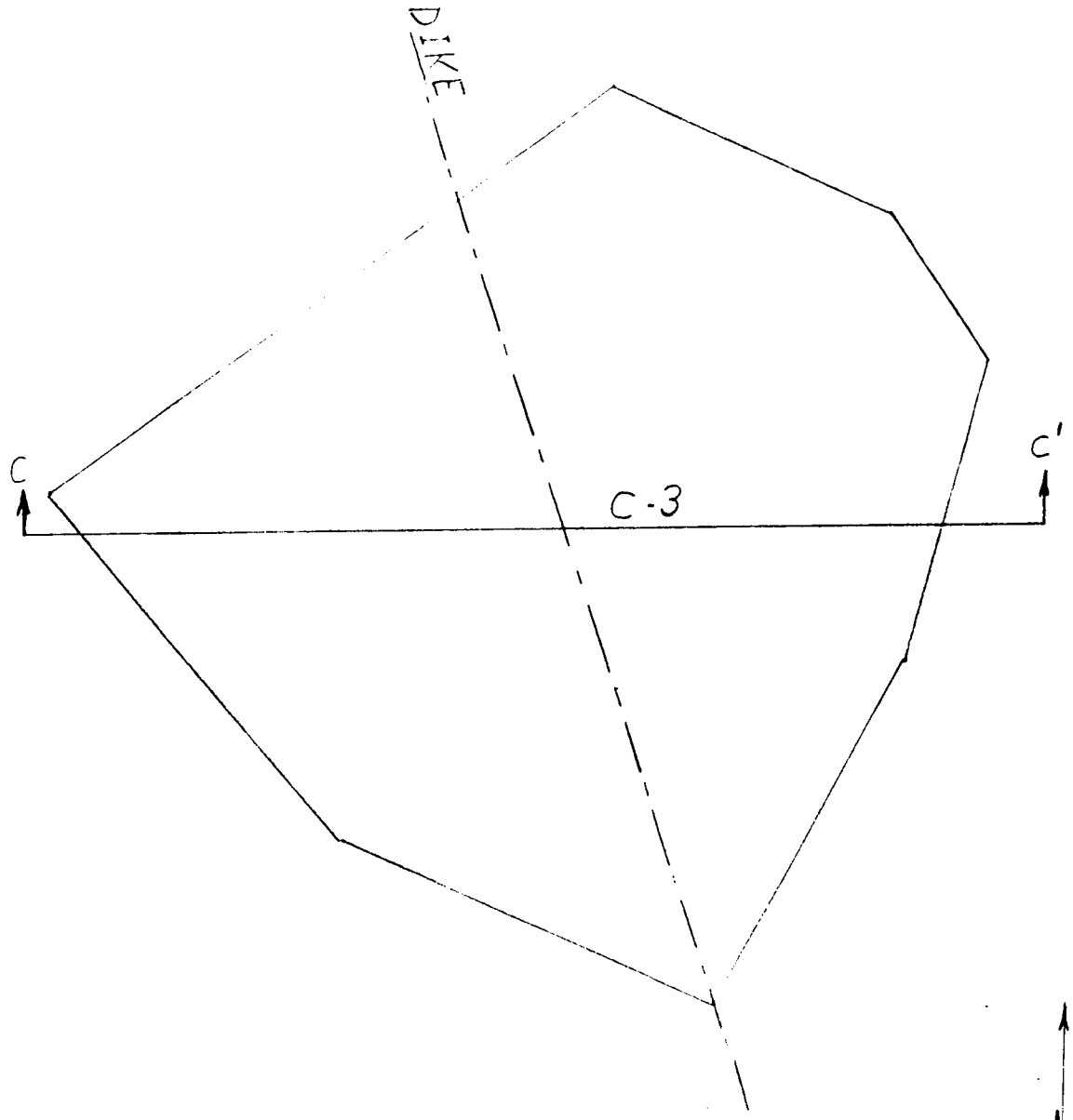


C-2 AREA - C
cross section of pit
No scale



North cross veiw

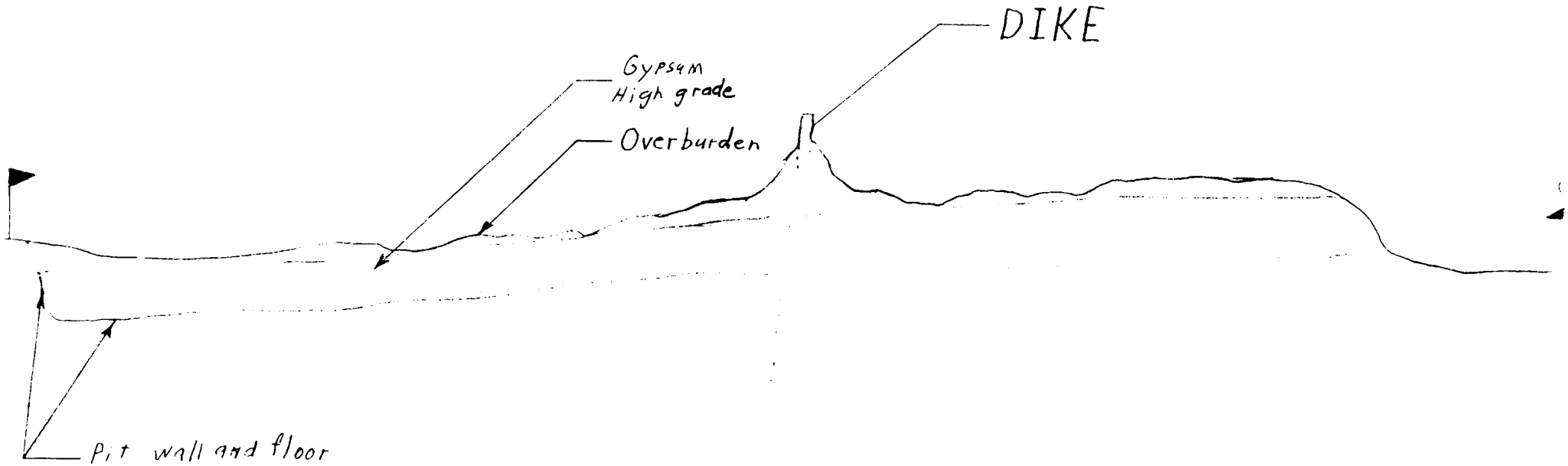
C-2 AREA-C
Reclamation
No scale



C-3 AREA-E

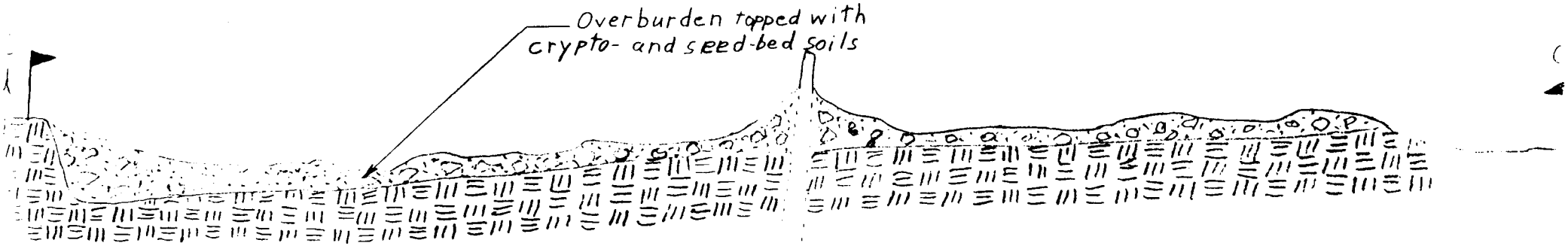
Plan view

No scale



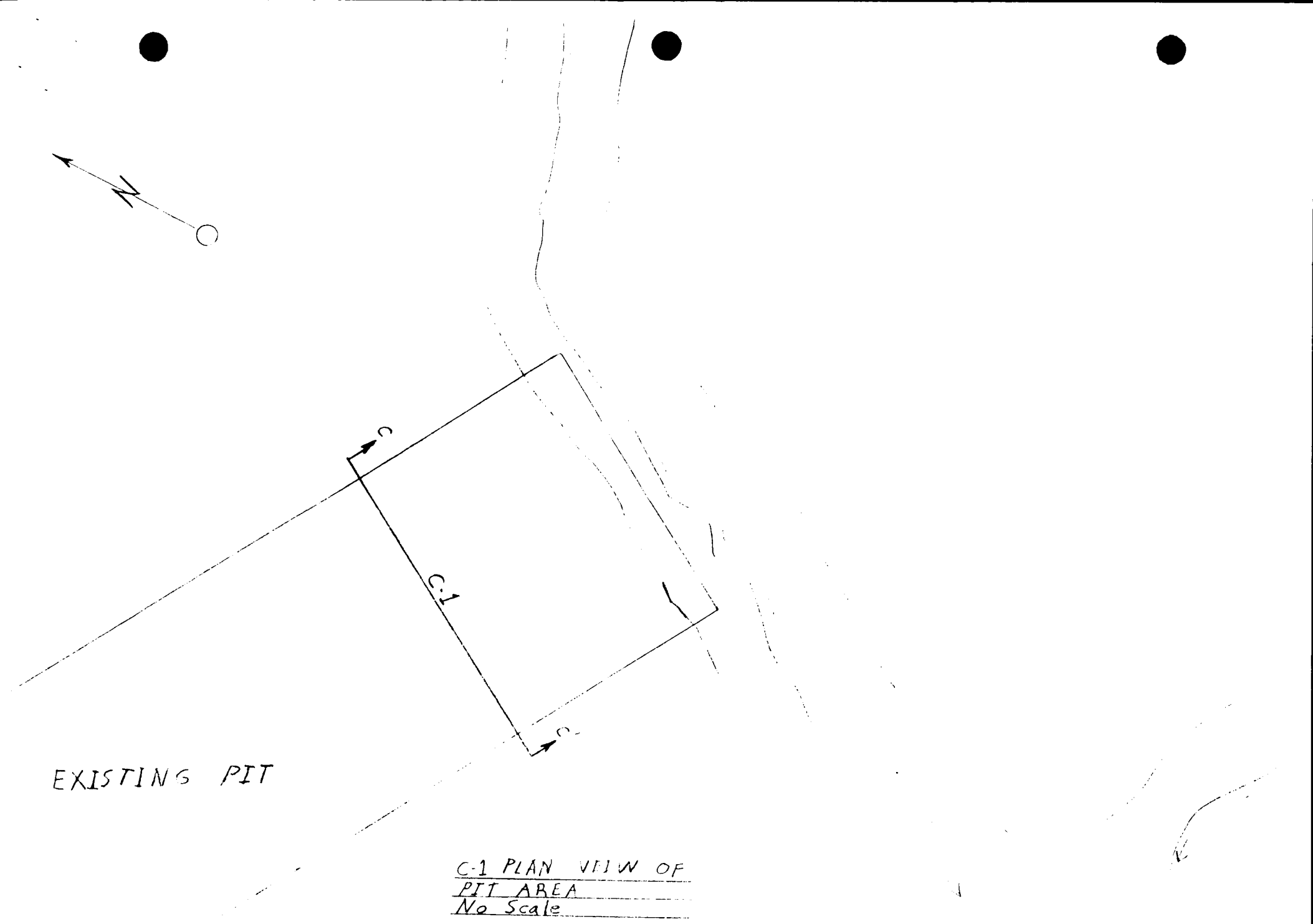
North section view

C-3 AREA - E cross section of pit
No scale

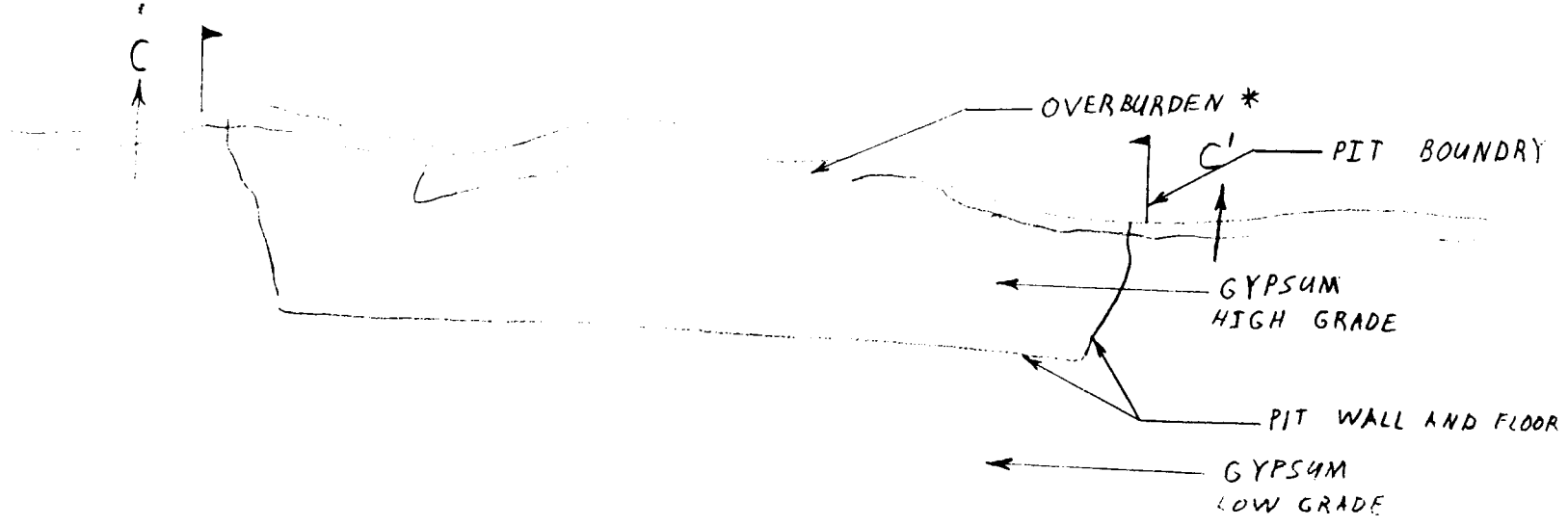


North section view

C-3 AREA-E
Reclamation
No scale



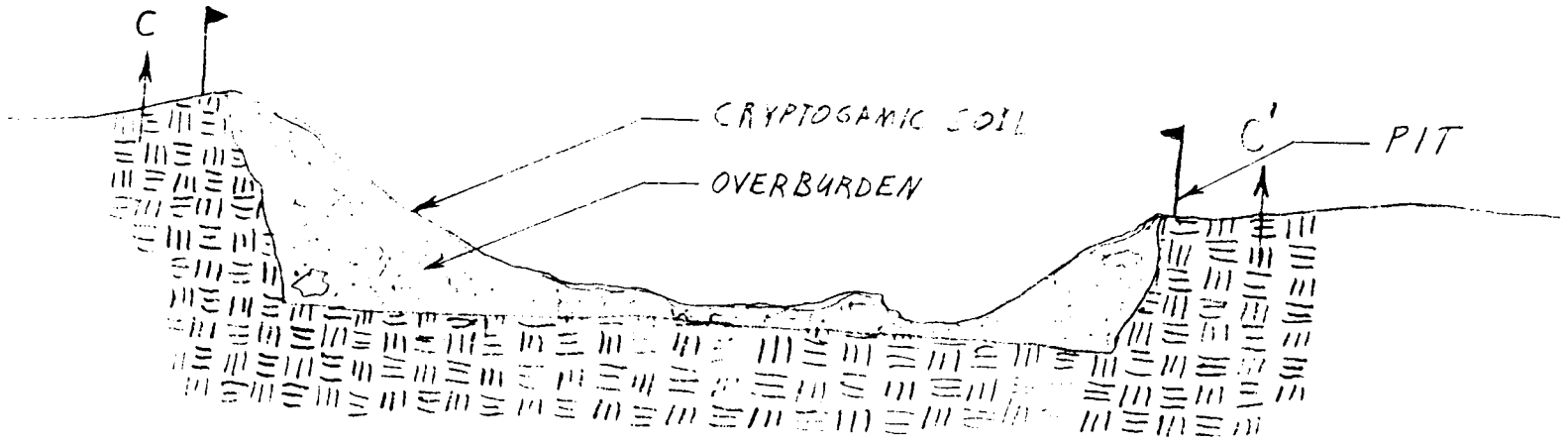
C-1 PLAN VIEW OF PIT AREA
No Scale



Southeast section view

* OVERBURDEN [illegible] CRYPTOGAMIC SOIL, [illegible]

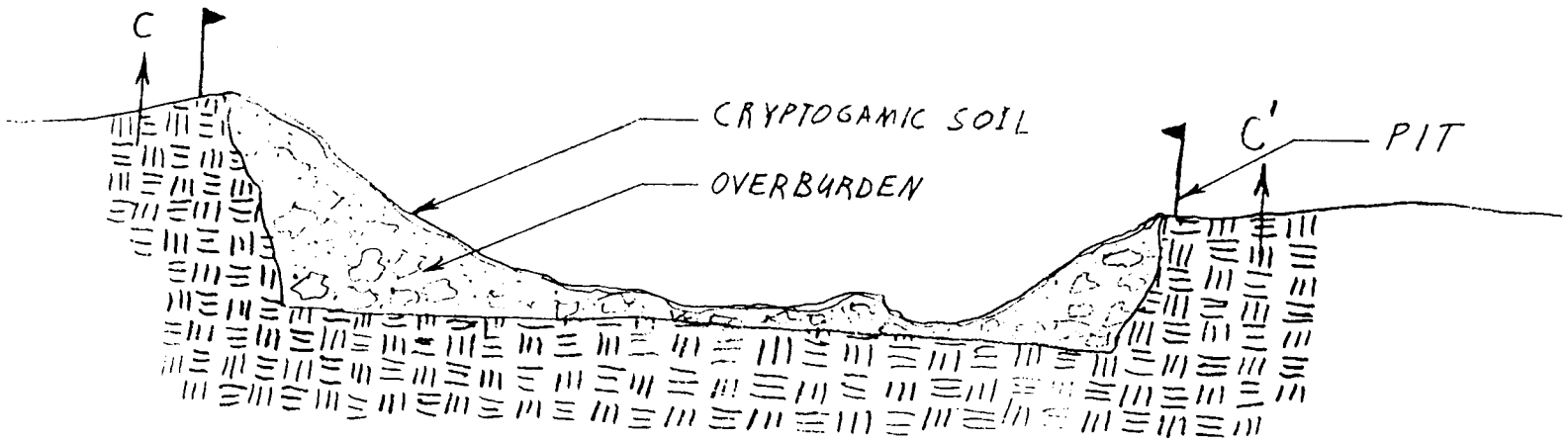
C-1 CROSS SECTION OF PIT AREA 1/0 SCALE



South east section view

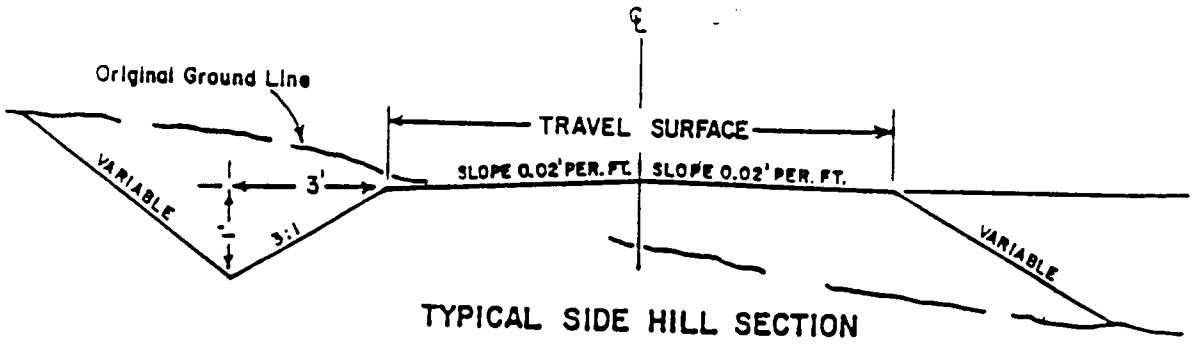
C-1 CROSS SECTION OF PIT AREA - RECLAMATION
No Scale

CROSS SECTION OF GYPSUM PIT AREA AFTER RECLAMATION

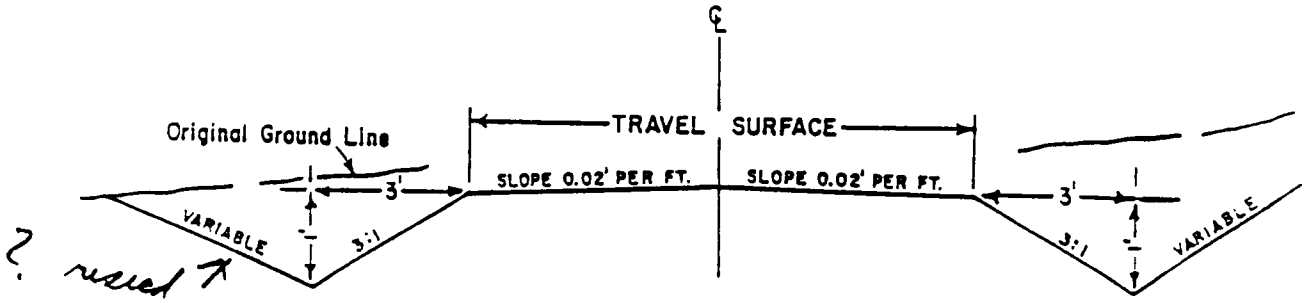


South-east section view

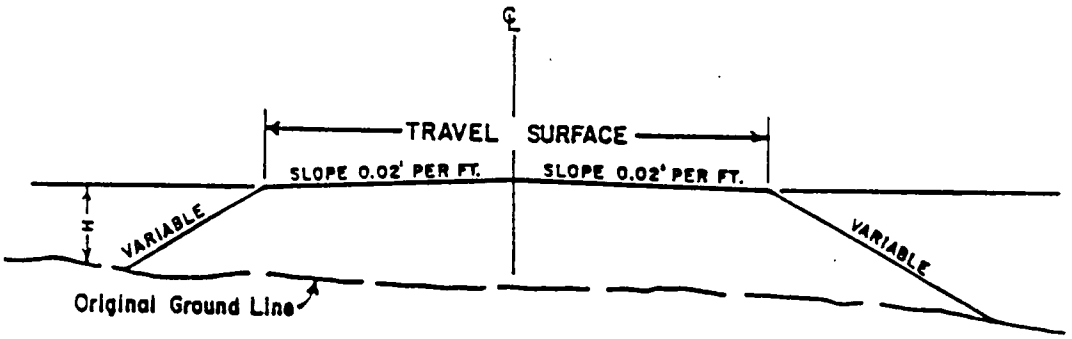
CROSS SECTION OF PIT AREA - RECLAMATION No Scale



TYPICAL SIDE HILL SECTION



TYPICAL FULL CUT SECTION



TYPICAL EMBANKMENT SECTION

Height of Cut or Fill	Cut Slope	Fill Slope
0' – 3'	3 : 1	4:1
3' – 10'	2 : 1	3:1
OVER 10'	1½:1	2:1
ROCK	¼:1	—

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

TYPICAL ROAD SECTIONS

DESIGNED R.A.D.
DRAWN J.H.S.
CHECKED RAP
RECOMM. _____
RECOMM. _____
APPROVED _____

SCALE NONE

VEGETATION, SOILS, AND THREATENED SPECIES INVENTORY

HEBE'S MOUNTAIN PROJECT EXPANSION
WESTERN CLAY COMPANY
VEGETATION, SOILS, THREATENED AND ENDANGERED SPECIES INVENTORY

EIS
ENVIRONMENTAL INDUSTRIAL SERVICES
4855 N. Spring Glen Rd., Spring Glen, UT 84526 - Telephone (801) 472-3814 - FAX (801) 472-8780

HEBE'S MOUNTAIN PROJECT EXPANSION - WESTERN CLAY COMPANY
VEGETATION, SOILS AND THREATENED AND ENDANGERED SPECIES INVENTORY

CONDUCTED BY EIS
AUGUST 27-28, 1996

INTRODUCTION

Western Clay Company is currently planning to expand it's gypsum mining operation on public land. The existing operation, located at T. 24 S., R. 7 E. Section 23, would encompass an additional 80 acres over five adjoining parcels within Sections 23 and 24 (See Plate 1: General Location Map). In order to facilitate this mine expansion, a vegetation and soils inventory of the expansion area, as directed by the Utah Division of Oil, Gas and Mining (DOGM), was conducted. Also, due to the known presence of Wright fishhook cactus (Sclerocactus wrightiae), within the general area, the Bureau of Land Management (BLM) required that a threatened and endangered species inventory be conducted as well.

In August of 1996, EIS was contracted to complete the vegetation, soils, and threatened and endangered species inventory required for the expansion area. The following report describes the general methodology followed during the inventory, as well as the findings and conclusions generated.

METHODOLOGY

The on-site evaluation of the proposed areas of disturbance was conducted on August 27-28, 1996. The inventory area, located within the southwestern end of the San Rafael Swell, is characterized by low precipitation, high temperature, and a sparse salt desert shrub habitat. Numerous small ephemeral runoff channels and ravines criss-cross the area. Gypsum is readily accessible throughout most of the area, where large concentrations have been exposed through weathering and/or by expansion. Extensive concentrations of cryptobiotic soils are found where gypsum is exposed or near to the surface. Exhibit 1 is a view characteristic of the area inventoried.

Originally, six areas totalling approximately 80 acres were identified as part of the inventory. Upon arrival at the site, Area A (4.74 Acres) was eliminated from the study and boundaries of Area B and Area D expanded to make up the difference. A range site evaluation was selected for description of the five proposed areas of disturbance (Areas B, C, D, E, and access road).

EXHIBIT 1

CHARACTERISTIC VIEW OF EXPANSION AREA

During a phone conversation with Lynn Kunzler of the DOGM, it was determined that a ground cover percentage and complete species list would be required for each vegetation type to be disturbed. During the on-site evaluation of the areas, only one major vegetation type; salt desert shrub, was determined. Vegetation was sampled using the line intercept point method, with points taken at uniform intervals (every two feet) along a 100 foot transect. Points were classified as bare, litter, rock, grass, forb, or shrub. Vegetation sampled along each transect was identified and included within the complete species list. A total of 53 transects were randomly located within a study area that incorporated the sites of disturbance as well as the immediate undisturbed surroundings.

A productivity estimate and woody plant density determination was conducted to evaluate the potential of post-mining reclamation. George Cook, Range Specialist for the Natural Resource Conservation Service (NRCS) was contacted for a productivity estimate. Due to the sparse cover present within the site, woody plant density was calculated using the belt transect method. Every shrub within a 10 by 100 foot (1000 square feet) area was counted on every other transect located during cover sampling (27 total).

A threatened and endangered species plant inventory was conducted in unison with the vegetation inventory. During a meeting with Wayne Luddington, BLM Biologist for Price River/San Rafael Resource Area, it was determined that a thorough walk over of the proposed areas of disturbance would be required due to the known presence of

the endangered Sclerocactus wrightiae, as well as the potential for other threatened species. During vegetation sampling and species identification, the areas of proposed disturbance were continuously evaluated for the potential of all such species. The boundaries of each area were inventoried, with the entire area of each traversed diagonally. Where Sclerocactus wrightiae was identified, flagging was placed and their immediate location plotted on a map.

Soils data was requested by the DOGM to evaluate the need for topsoil salvage and the potential of post-mining reclamation. Prior to the on-site inventory, Leland Sasser, a NRCS Soil Scientist, was contacted to determine what soils may be present within the area. Though soils mapping within the area is in the process of being prepared, the presence of Mussentuchit-Goblin-Robroost Complex was identified as occurring within the site. Description of this complex is included within Attachment 1.

During the on-site survey, seven sites indicative of the area of proposed disturbance were identified for sampling. Localized areas where soils were deposited by wind, and therefore, much deeper, were avoided since they were not representative of the entire area. Sample sites were selected based on uniqueness (i.e. color, depths to gypsum, and location). Soil was collected using a three by six inch core auger, with a composite sample taken to the contact with the gypsum layer.

RESULTS

Twenty-five species were identified as occurring within the five areas. These species are shown in Table 1. The 53 random transects inventoried within the site yielded 2,650 points. Of these points, 85.81 percent were bare, 6.72 percent were litter and 0.75 percent were rock. Vegetation made up 6.72 percent of the cover, with 0.75 percent as grasses, 0.08 percent as forbs, and 5.89 percent as shrubs. Percent composition by plant species is shown in Table 2.

The productivity estimate conducted by the NRCS is included as Attachment 1.

The 27 shrub density belt transects sampled approximately 0.62 acres and yielding 1,841 shrubs of nine different species. Using the calculation methodology for belt transects described in the DOGM vegetation guidelines, shrub density approximates 2,970 shrubs per acre. Shrubs were dominated by small (< 4 inches) Atriplex corrugata, which made up 83.11 percent of the shrubs counted. Table 3 shows the number and percentage of each shrub species sampled during the density inventory, as well as a calculated number of the species sampled per acre.

TABLE 1

PLANT SPECIES IDENTIFIED WITHIN THE AREAS OF THE PROPOSED DISTURBANCE

SCIENTIFIC NAME	COMMON NAME
Artemisia nova	dwarf sagebrush
Atriplex canescens	four-wing saltbush
Atriplex confertifolia	shadscale
Atriplex corrugata	mat saltbush
Brassica spp.	mustard
Chrysothamnus nauseosus	rubber rabbitbrush
Cryptantha flava	golden cryptantha
Distichlis spicata	desert saltgrass
Ephedra torreyanna	Torrey joint-fir
Eriogonum inflatum	desert trumpet
Eriogonum spp.	buckwheat
Eurotia lanata	winter fat
Gutierrezia sarothrae	broom snakeweed
Halogeton glomeratus	halogeton
Hilaria jamesii	galleta
Kochia americana	green molly
Mentzilia pumila	stickleaf blazing-star
Opuntia spp.	prickly-pear
Oryzopsis hymenoides	Indian ricegras
Rhus aromatic var. trilobata	skunkbush
Salsola iberica	Russian thistle
Sclerocactus wrightiae	Wright fishhook cactus
Sphaeralcea parvifolia	small flowered globemallow
Stanleya pinnata	princes plume
Tamarix pentandra	tamarisk

TABLE 2

PERCENT OF COVER COMPOSITION BY SPECIES

COVER	SPECIES	COVER (%)
Grasses	Oryzopsis hymenoides	0.49
	Hilaria jamesii	0.26
Forbs	Brassica Spp.	0.08
Shrubs	Atriplex corrugata	2.60
	Chrysothamnus nauseosus	1.47
	Ephedra torreyanna	1.25
	Atriplex confertifolia	0.42
	Kochia americana	0.08
	Eurotia lanata	0.04
	Sclerocactus wrightiae	0.04

TABLE 3

SHRUB DENSITY

SPECIES	NUMBER	PERCENTAGE	CALCULATED (ACRE)
Atriplex corrugata	1,530	83.11	2,468
Atriplex confertifolia	115	6.25	186
Chrysothamnus nauseosus	85	4.62	136
Ephedra torreyanna	75	4.07	121
Kochia americana	28	1.52	45
Eurotia lanata	3	0.16	5
Sclerocactus wrightiae	3	0.16	5
Sphaeralcea parvifolia	1	0.05	2
Artemisia nova	1	0.05	2

Twenty-eight Sclerocactus wrightiae, in groups of one to four, were identified at 15 different locations within the expansion areas (See Plate 1). Location of the cactus were generally near or associated with an ephemeral gully. No other threatened, endangered, or sensitive species was identified within the area.

Where soil was sampled, depths were generally shallow (< 8 inches). Gypsum was exposed, or near to the surface over the majority of the study area. Most of the composite samples taken contain precipitated gypsum within the top eight inches. An exception to this is where wind blown material has been deposited on sideslopes or where material has been deposited during ephemeral flows in drainages and gullies. Soils in these areas were up to 48 inches deep and composed mostly of sand. Samples taken were provided to Intermountain Laboratory in Farmington, New Mexico for analysis. Attachment 2 includes the results of analysis performed.

CONCLUSIONS

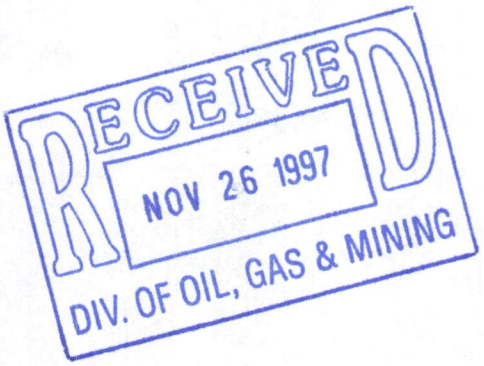
From the data generated during the inventories, it is the conclusion of EIS that vegetation is limited within the area by extreme climate (high temperatures and low precipitation) and poor soil substrate. The area is extremely sparse and supports little species diversity or productivity. Shrub density, though appearing significant, consists mostly of Atriplex corrugata, a low growing shrub that is less than four inches high. Many of the shrubs present are associated with the ephemeral gullies and washes and considered as untypical of the majority of the site. As shown in Exhibit 1, the area is composed mostly of bare ground covered by extensive cryptobiotic development. Though considered a sensitive soil by the BLM, its presence within the site is not considered a limiting factor by that office.

The presence of Sclerocactus wrightiae within the site, however, is a recognizable concern. Though the site is not considered the sole endemic source of this species, it is considered significant due to the endangered status of the plant. Potential mitigation of this issue may be addressed by transplanting to a predetermined protected area, donation of the plants to a educational institution, or alteration of the expansion area boundaries to

exclude disturbance. Review of this matter is currently being conducted by the BLM, Price River/San Rafael Resource Area.

5/6

M/015/072



ATTACHMENT 1

NRCS SOILS DESCRIPTION AND PRODUCTIVITY ESTIMATE

UNITED STATES
DEPARTMENT OF
AGRICULTURE

NATURAL RESOURCES
CONSERVATION
SERVICE

PRICE FIELD OFFICE
350 NORTH 400 EAST
PRICE, UTAH 84501

September 9,1996

Western Clay
580 East Center Street
Aroura, Utah 84620

To Whom It May Concern:

Here is the condition and production of the gypsum mine site located in T 24E R 7E Sec. 23 and 24. The area is mostly gypsum rock to the surface. The production of the Desert Shallow Gypsum site is less than one hundred pounds of total herbage per acre. The condition of the site is good.

George S. Cook

George S. Cook
Range Conservationist

CC: Mel Coonrod EIS

<SCS-UTAH COMPLEX TEMPLATE, 7/90>
August 26, 1996

Mussentuchit=Goblin=Robroost, 5 to 20 percent slopes

Setting

Position on landscape: Structural benches, questas, alluvial fans and rolling plains
Elevation: 4500 to 7100 feet
Average annual precipitation: About 5 to 8 inches
Average annual air temperature: About 48 to 52 degrees F
Frost-free period: About 120 to 160 days
Shape of slopes: Convex

Composition

Mussentuchit soil and similar inclusions: 40 percent
Goblin soil and similar inclusions: 25 percent
Robroost soil and similar inclusions: 20 percent
Gypsumland and similar inclusions: 10 percent
Contrasting inclusions: 5 percent

Characteristics of the Mussentuchit Soil

Position on landscape: Convex areas on questas and structural benches
Slope range: 5 to 15 percent
Shape of slopes: Convex
Present vegetation: *
Rock fragments on the surface: Kind=*; percentage of surface covered=*

<Typical><Reference> profile:

0 to 3 inches=light reddish brown fine sandy loam
3 to 9 inches=pink sandy loam
9 to 27 inches=pinkish white sandy loam
27 inches=Gypsum rock and gypsiferous shale
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Kind=Residuum; source=gypsiferous sandstone and shale
Permeability: Moderately rapid
Available water capacity: * (* to * inches)
Water-supplying capacity: * to * inches
Potential rooting depth: 20 to 40 inches
Runoff: *
Hazard of water erosion: *
Hazard of wind erosion: *

Characteristics of the Goblin Soil

Position on landscape: *
Slope range: 5 to 20 percent
Shape of slopes: Convex
Present vegetation: *
Rock fragments on the surface: Kind=*; percentage of surface covered=*

<Typical><Reference> profile:

0 to 3 inches=strong brown fine sandy loam
3 to 17 inches=brown fine sandy loam
17 inches=gypsiferous shale
Depth to Gypsiferous shale or soft sandstone: 5 to 20 inches
Depth class: Shallow (5 to 20 inches)
Drainage class: Well drained
Parent material: Kind=Residuum; source=Gypsiferous shale and sandstone
Permeability: Moderately rapid
Available water capacity: * (* inches)
Water-supplying capacity: * inches
Potential rooting depth: 5 to 20 inches
Runoff: *
Hazard of water erosion: *
Hazard of wind erosion: *

Characteristics of the Robroost Soil

Position on landscape: Benches and alluvial plains
Slope range: 5 to 12 percent
Shape of slopes: Convex to concave
Present vegetation: *
Rock fragments on surface: Kind=*; percentage of surface covered=*

<Typical><Reference> profile:

0 to 3 inches=light brown fine sandy loam
3 to 8 inches=reddish yellow fine sandy loam
8 to 65 inches=reddish yellow fine sandy loam
65 to 80 inches=light brown fine sandy loam
Depth class:Very Deep or Deep (40 to 80 inches or more)
Drainage class: Well drained
Parent material: Kind=Alluvium, eolian sediments and residuum; source=Gypsiferous sandstone and shale
Permeability: Moderate
Available water capacity: * (* to * inches)
Water-supplying capacity: * inches
Potential rooting depth: 40 to 80 inches
Runoff: *
Hazard of water erosion: *
Hazard of wind erosion: *

Included Areas

Contrasting inclusions:
10 percent-Gypsumland on steep sideslopes of gullies or questa backslopes
5 percent-Other soils which include Jornaham, Trachute and Moffat in drainageways and on low gently sloping concave benches, Bributte on convex shale areas, also included are rock outcrop and badland areas

Major Uses

Rangeland, recreation, and wildlife

Major Management Factors

Soil-related factors:
Mussentuchit soil=Moderately deep to shale or soft sandstone
Goblin soil=Shallow to shale
Climate-related factors:
All soils=droughty
* soil=*
Rangeland
Composition of potential plant community:
* soil=* to * percent grasses, * to * percent forbs, * to * percent shrubs
* soil=* to * percent grasses, * to * percent forbs, * to * percent shrubs
* soil=* to * percent grasses, * to * percent forbs, * to * percent shrubs
Dominant vegetation in potential plant community:
* soil=*
* soil=*
* soil=*
General management considerations:
*
*
*

Interpretive Groups

Capability classification:
Mussentuchit soil=VIIe, nonirrigated;
Goblin soil=VIIs, nonirrigated;
Robroost soil=VIIe, nonirrigated;
Range site:
Mussentuchit and Robroost soils=Desert Gypsum D34-105
Goblin soil=Desert Shallow Gypsum D34-116

Inter-Mountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

WESTERN CLAY CO.
Aurora, Utah

LOCATION: San Rafael Swell

DATE SAMPLED: August 27 & 28, 1996
DATE REPORTED: October 4, 1996

Lab No.	Location	Depths Inches	pH	EC mmhos/cm @ 25°C	Saturation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Sand %	Silt %	Clay %	Texture
49289	SS#1	0.0-18.0	7.3	2.54	30.8	33.6	2.75	0.69	0.16	49.0	37.0	14.0	LOAM
49290	SS#2	0.0-18.0	7.4	2.56	27.7	33.0	3.08	0.64	0.15	45.0	41.0	14.0	LOAM
49291	SS#3	0.0-8.0	7.6	2.60	35.8	33.6	3.10	0.75	0.17	40.0	44.0	16.0	LOAM
49292	SS#4	0.0-18.0	7.6	2.52	37.8	33.3	2.05	0.52	0.12	53.0	33.0	14.0	SANDY LOAM
49293	SS#5	0.0-6.0	7.5	2.52	32.8	34.1	1.20	0.51	0.12	53.0	37.0	10.0	SANDY LOAM
49294	SS#6	0.0-6.0	7.6	2.93	28.0	32.3	5.16	2.30	0.53	64.0	30.0	6.0	SANDY LOAM
49295	SS#7	0.0-8.0	7.6	3.64	37.6	28.9	9.71	9.13	2.08	30.0	50.0	20.0	SILT LOAM

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

Inter-Mountain Laboratories, Inc.

2506 West Main Street | Farmington, New Mexico 87401 | Tel. (505) 326-4737

WESTERN CLAY CO.
Aurora, Utah

DATE SAMPLED: August 27 & 28, 1996
DATE REPORTED: October 4, 1996

LOCATION: San Rafael Swell

Lab No.	Location	Depths Inches	Organic Matter %	Carbonate %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
49289	SS#1	0.0-18.0	9.8	12.1	0.66	20.6	121.	100.					
49290	SS#2	0.0-18.0	2.9	12.3	0.06	1.77	123.	121.					
49291	SS#3	0.0-8.0	2.4	10.8	5.76	180.	108.	-72.2	1.07	4.11	0.58	128.	-20.6
49292	SS#4	0.0-18.0	0.6	6.9	9.57	299.	69.0	-230.	0.30	3.49	5.78	109.	-40.0
49293	SS#5	0.0-6.0	3.1	9.0	4.18	131.	90.0	-40.6	0.87	3.12	0.19	97.4	-7.41
49294	SS#6	0.0-6.0	1.7	10.3	9.01	281.	103.	-179.	0.03	2.43	6.55	75.9	26.6
49295	SS#7	0.0-8.0	9.8	12.1	1.43	44.7	121.	75.8					

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential

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DATE SAMPLED: August 27 & 28, 1996
DATE REPORTED: October 4, 1996

Lab No.	Location	Depths Inches	P ppm	K ppm	Nitrate-Nitrogen ppm	CEC meq/100g	Total Kjeldahl Nitrogen %	H2O Sol Selenium ppm
49289	SS#1	0.0-18.0	2.67	3.90	0.64	108.	0.04	<0.02
49290	SS#2	0.0-18.0	2.45	4.40	1.38	102.	0.06	<0.02
49291	SS#3	0.0-8.0	0.55	3.70	1.70	121.	0.04	<0.02
49292	SS#4	0.0-18.0	0.45	2.60	<0.01	97.0	0.08	<0.02
49293	SS#5	0.0-6.0	1.00	2.60	1.86	97.4	0.08	<0.02
49294	SS#6	0.0-6.0	0.55	3.60	2.08	85.7	0.09	<0.02
49295	SS#7	0.0-8.0	1.84	8.80	2.26	120.	0.07	<0.02

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, ABPTA= Ammonium Bicarbonate-DPTA, AAO= Acid Ammonium Oxalate
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

Inter-Mountain Laboratories, Inc.
2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

WESTERN CLAY CO.
Aurora, Utah

DATE SAMPLED: August 27 & 28, 1996
DATE REPORTED: October 4, 1996

LOCATION: San Rafael Swell

Lab No.	Location	Depths Inches	pH	EC mmhos/cm @ 25°C	Saturation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Sand %	Silt %	Clay %	Texture
49291	SS#3	0.0-8.0	7.6	2.60	35.8	33.6	3.10	0.75	0.17	40.0	44.0	16.0	LOAM
49297	49291(DUP)	0.0-8.0	7.7	2.74	34.8	34.2	3.31	0.81	0.19	41.0	42.0	17.0	LOAM

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

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WESTERN CLAY CO.
Aurora, Utah

DATE SAMPLED: August 27 & 28, 1996
DATE REPORTED: October 4, 1996

LOCATION: San Rafael Swell

Lab No.	Location	Depths Inches	Organic Matter %	Carbonate %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
49291	SS#3	0.0-8.0	2.4	10.8	5.76	180.	108.	-72.2	1.07	4.11	0.58	128.	-20.6
49297	49291(DUP)	0.0-8.0	2.4	10.8	5.97	187.	108.	-78.8	1.14	4.26	0.57	133.	-25.3

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential

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WESTERN CLAY CO.
Aurora, Utah

DATE SAMPLED: August 27 & 28, 1996
DATE REPORTED: October 4, 1996

LOCATION: San Rafael Swell

Lab No.	Location	Depths Inches	P ppm	K ppm	Nitrate-Nitrogen ppm	CEC meq/100g	Total Kjeldahl Nitrogen %	H2O Sol Selenium ppm
49291	SS#3	0.0-8.0	0.55	3.70	1.70	121.	0.04	<0.02
49297	49291(DUP)	0.0-8.0	0.61	3.70	1.60	104.	0.04	<0.02

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, ABPTA= Ammonium Bicarbonate-DPTA, AAO= Acid Ammonium Oxalate
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

Inter-Mountain Laboratories, Inc.

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Farmington, New Mexico 87401

Client:	WESTERN CLAY CO.	Date Reported:	10/4/96
Project:	San Rafael Swell	Date Sampled:	8/27/96
Laboratory ID:	49289	Date Received:	9/4/96
Sample ID:	SS #1 0-18" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

[redacted]

Lab pH	7.3	s.u.		
Total Alkalinity as CaCO3	84.0	mg/L		
Bicarbonate as HCO3	103	mg/L	1.68	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By: _____

Inter·Mountain Laboratories, Inc.

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Farmington, New Mexico 87401

Client:	WESTERN CLAY CO.	Date Reported:	10/4/96
Project:	San Rafael Swell	Date Sampled:	8/27/96
Laboratory ID:	49290	Date Received:	9/4/96
Sample ID:	SS #2 0-18" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

[redacted]

Lab pH	7.4	s.u.		
Total Alkalinity as CaCO3	110	mg/L		
Bicarbonate as HCO3	134	mg/L	2.20	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By: [redacted]

Inter-Mountain Laboratories, Inc.

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Client:	WESTERN CLAY CO.	Date Reported:	10/4/96
Project:	San Rafael Swell	Date Sampled:	8/27/96
Laboratory ID:	49291	Date Received:	9/4/96
Sample ID:	SS #3 0-18" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

[redacted]

Lab pH	7.6	s.u.		
Total Alkalinity as CaCO3	80.0	mg/L		
Bicarbonate as HCO3	97.6	mg/L	1.60	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By: JB

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2506 W Main Street
Farmington, New Mexico 87401

Client:	WESTERN CLAY CO.	Date Reported:	10/4/96
Project:	San Rafael Swell	Date Sampled:	8/28/96
Laboratory ID:	49292	Date Received:	9/4/96
Sample ID:	SS #4 0-18" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

[redacted]

Lab pH	7.6	s.u.		
Total Alkalinity as CaCO3	60.0	mg/L		
Bicarbonate as HCO3	73.2	mg/L	1.20	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By: JB

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Farmington, New Mexico 87401

Client:	WESTERN CLAY CO.	Date Reported:	10/4/96
Project:	San Rafael Swell	Date Sampled:	8/28/96
Laboratory ID:	49293	Date Received:	9/4/96
Sample ID:	SS #5 0-6" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

[redacted]

Lab pH	7.5	s.u.		
Total Alkalinity as CaCO3	110	mg/L		
Bicarbonate as HCO3	134	mg/L	2.20	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By: GB

GB

Inter-Mountain Laboratories, Inc.

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Farmington, New Mexico 87401

Client:	WESTERN CLAY CO.	Date Reported:	10/4/96
Project:	San Rafael Swell	Date Sampled:	8/28/96
Laboratory ID:	49294	Date Received:	9/4/96
Sample ID:	SS #6 0-6" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

[redacted]

Lab pH	7.6	s.u.		
Total Alkalinity as CaCO3	82.0	mg/L		
Bicarbonate as HCO3	97.6	mg/L	1.60	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By: SB

Inter-Mountain Laboratories, Inc.

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Farmington, New Mexico 87401

Client:	WESTERN CLAY CO.	Date Reported:	10/4/96
Project:	San Rafael Swell	Date Sampled:	8/28/96
Laboratory ID:	49295	Date Received:	9/4/96
Sample ID:	SS #7 0-8" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

[redacted]

Lab pH	7.6	s.u.		
Total Alkalinity as CaCO3	80.0	mg/L		
Bicarbonate as HCO3	97.6	mg/L	1.60	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By: [signature]

iml
Inter-Mountain
Laboratories, Inc.

2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

April 21, 1997

Mr. Neal Mortensen
P.O. Box 127
Aurora, Utah 84620

Dear Mr. Mortensen:

Enclosed are the rerun results for the soil samples collected on August 27 and 28, 1996. The analyses requested were pH, EC, SAR, CEC, Alkalinity, Sulfur, ABP, P, and K.

Original samples had been archived and new samples were ground and reanalyzed. This will explain the differences in results. Also please note that the original Potassium numbers were reported in meq/L and not ppm as the new results are. The original Phosphorus numbers were also reported incorrectly. The correct numbers would be:

49289-0.25 ppm
49290-0.23 ppm
49291-0.03 ppm
49292-0.02 ppm
49293-0.08 ppm
49294-0.03 ppm
49295-0.16 ppm

This error was an oversight on data input, reporting and reviewing. I apologize for the inconvenience.

Please call if you have any questions regarding the information provided in this report.

Sincerely,

Gloria Bartlett

Gloria Bartlett
Assistant Lab Manager
IML-Farmington

enclosure: Analytical Report

Inter-Mountain Laboratories, Inc.

2506 West Main Street | Farmington, New Mexico 87401 | Tel. (505) 326-4737

WESTERN CLAY COMPANY
Aurora, UT
Location: San Rafael Swell
Reruns

Date Sampled: August 28, 1996
Date Reported: April 17, 1997

Lab No.			pH	EC mmhos/c @ 25C	Calcium meq/l	Magne-sium meq/l	Sodium meq/l	SAR
49289	SS#1	0.0-18.0	7.4	2.43	30.0	2.32	0.61	0.15
49292	SS#4	0.0-18.0	7.4	2.56	33.0	3.08	0.64	0.15
49294	SS#6	0.0-6.0	7.6	2.60	33.6	3.10	0.75	0.18
49295	SS#7	0.0-8.0	7.6	2.57	32.9	2.15	0.48	0.11

imL

Inter-Mountain Laboratories, Inc.

2506 West Main Street | Farmington, New Mexico 87401 | Tel. (505) 326-4737

WESTERN CLAY COMPANY
Aurora, UT
Location: San Rafael Swell
Reruns

Date Sampled: August 28, 1996
Date Reported: April 17, 1997

Lab No.			Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
49289	SS#1	0.0-18.0	0.77	24.0	91.8	67.7	0.67	0.10	-0.01	3.12	88.6
49292	SS#4	0.0-18.0	11.2	349	68.5	-281	0.90	5.81	4.49	181	-112
49294	SS#6	0.0-6.0	9.86	308	109	-198.00	-0.01	3.35	6.53	104	4.62
49295	SS#7	0.0-8.0	1.65	51.5	117	65.6	0.96	0.69	-0.01	21.5	95.6

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WESTERN CLAY COMPANY
Aurora, UT
Location: San Rafael Swell
Reruns

Date Sampled: August 28, 1996
Date Reported: April 17, 1997

Lab No.			P ppm	Potassium ppm	Nitrate-Nitrogen ppm	CEC meq/100g
49289	SS#1	0.0-18.0	2.60	154	0.92	122
49292	SS#4	0.0-18.0	2.30	171	1.38	102
49294	SS#6	0.0-6.0	0.30	144	1.70	121
49295	SS#7	0.0-8.0	0.20	99.9	0.60	71.4

Inter-Mountain Laboratories, Inc.

2506 W Main Street
Farmington, New Mexico 87401

Client:	WESTERN CLAY CO.	Date Reported:	3/20/97
Project:	San Rafael Swell	Date Sampled:	8/27/96
Laboratory ID:	49289	Date Received:	9/4/96
Sample ID:	SS #1 0-18" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

Parameter	Analytical Result	Units		Units
Total Alkalinity as CaCO3	75.3	mg/L		
Bicarbonate as HCO3	91.9	mg/L	1.51	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By:

Inter-Mountain Laboratories, Inc.

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Farmington, New Mexico 87401

Client:	WESTERN CLAY CO.	Date Reported:	3/20/97
Project:	San Rafael Swell	Date Sampled:	8/27/96
Laboratory ID:	49289	Date Received:	9/4/96
Sample ID:	SS #1 0-18" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

Parameter	Analytical Result	Units		Units
Total Alkalinity as CaCO3	75.3	mg/L		
Bicarbonate as HCO3	91.9	mg/L	1.51	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	WESTERN CLAY CO.	Date Reported:	3/20/97
Project:	San Rafael Swell	Date Sampled:	8/28/96
Laboratory ID:	49294	Date Received:	9/4/96
Sample ID:	SS #6 0-6" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

Parameter	Analytical Result	Units		Units
Total Alkalinity as CaCO3	96.0	mg/L		
Bicarbonate as HCO3	117	mg/L	1.92	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By:

Inter-Mountain Laboratories, Inc.

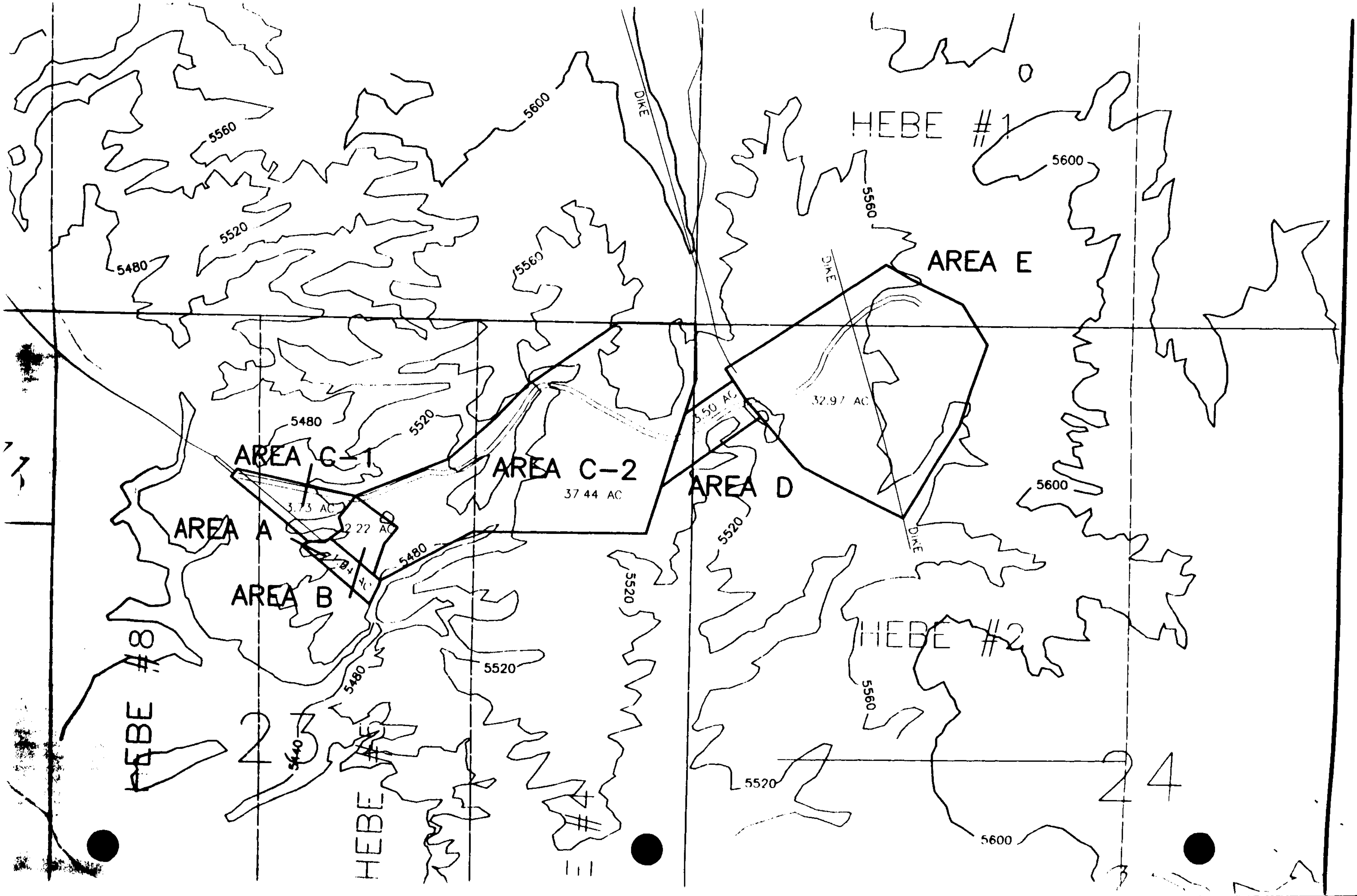
2506 W. Main Street
Farmington, New Mexico 87401

Client:	WESTERN CLAY CO.	Date Reported:	3/20/97
Project:	San Rafael Swell	Date Sampled:	8/28/96
Laboratory ID:	49295	Date Received:	9/4/96
Sample ID:	SS #7 0-8" Composite		
Sample Matrix:	Soil		
Condition:	Intact		

Parameter	Analytical Result	Units		Units
Total Alkalinity as CaCO3	86.6	mg/L		
Bicarbonate as HCO3	106	mg/L	1.73	meq/L
Carbonate as CO3	<1.00	mg/L	<1.00	meq/L
Hydroxide as OH	<1.00	mg/L	<1.00	meq/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1973. "Standard Methods For The Examination of Water and Waste Water", 19th ed., 1995.

Reviewed By:


HEBE #1
HEBE #2
HEBE #4
HEBE #8
AREA E
32.97 AC
DIKE
AREA D
3.50 AC
AREA C-2
37.44 AC
AREA C-1
3.73 AC
2.22 AC
AREA A
AREA B
5600
5560
5520
5480
5440
23
24

E I S
ENVIRONMENTAL INDUSTRIAL SERVICES
4855 N. Spring Glen Rd., Spring Glen, UT 84526 - Telephone (801) 472-3814 - FAX (801) 472-8780

HEBE'S MOUNTAIN PROJECT EXPANSION - WESTERN CLAY COMPANY
THREATENED AND ENDANGERED SPECIES INVENTORY

CONDUCTED BY EIS
OCTOBER 3, 1996

An intensive threatened and endangered species inventory was conducted on October 3, 1996. Fourteen individuals were involved with this field inventory which included: locating, counting, marking with flags, and plotting on maps all Wright fishhook cacti (*Sclerocactus wrightiae*), that were located. The Hebe's Mountain expansion area is divided into five possible mining areas (Area B, 150' Swath, Area C, Area D, and Area F) and one road right-of-way (ROW) (See accompanying map). Locations of specific Wright fishhook cacti are marked in red on the map where concentrations are limited, areas of higher density have been shaded in grey.

RESULTS:

Area B:

After half of Area B was inventoried it was determined by Wallace Curtis, Representative from the Western Clay Company, that the area had too high a concentration of Wright fishhook cacti and mining efforts for Area B would be abandoned.

150' swath adjacent to active mine:

An additional corridor, one hundred and fifty foot wide, adjacent to the active mine site was inventoried. Between five and nine (depending on the exact location of the southwest boundary) endangered cacti were located and flagged within this area. It is felt, given the intensity of the survey and the small area involved, that a high percentage of the existing Wright fishhook cacti were located.

Area C:

Within this area 31 endangered cacti were located and flagged. These cacti were distributed in two areas of concentrations as shown on the accompanying map. Once agin it is felt, given the intensity of the survey and the small area involved, that a high percentage of the existing Wright fishhook cacti were located.

Area D:

Within this area, one of the two largest staked off for mining expansion, 550 Wright fishhook cacti were located. Divided into small groups, the fourteen individuals traversed the entire area counting, flagging, and marking down on a map the location of the endangered cacti. The cacti found in the extreme norther portion were counted and plotted on maps but were not marked in the field because the flagging and stakes ran out.

Area F:

This area was inventoried by the entire group walking in a line with approximately eight foot spacing between individuals. Seven swaths were needed to cover the entire area. The first swath covered the northern most portion and each additional swath was just south of the last, as shown on the map. A combined total of 395 endangered cacti were inventoried with the majority of them in the northern half, the cacti were not flagged.

Swath #	Number of Wright fishhook Cacti
1	135
2	80
3	100
4	40
5	20
6	10
7	10

ROAD ROW:

Within the ROW of the access road 28 endangered cacti were located. As shown on the map, 8 were located north of the center line and 20 were located south of the center line.

SENCO-PHENIX

AN INTENSIVE CULTURAL RESOURCE SURVEY AND INVENTORY OF WESTERN CLAY COMPANY GYPSUM MINE

Emery County

PERFORMED FOR
Western Clay Company

In Accordance with BLM and
Utah State Guidelines
Antiquities Permit #U96SC0466b

SPUT-187
August 29, 1996

John A. Senulis

Direct Charge of Fieldwork

P.O. BOX 187, MOUNT PLEASANT, UTAH 84647 • PHONE 801-462-0291 • FAX 801-462-0292 • ARCHEOLOGICAL CONSULTING SERVICE

U.S. Department of the Interior
Bureau of Land Management
Utah State Office

Summary Report of
Inspection for Cultural Resources

For BLM Use Only
BLM Report ID No. ☐☐☐ ☐☐☐☐☐☐☐☐ (1 4 10)

Report Acceptable Yes☐ No☐
Mitigation Acceptable Yes☐ No☐
Comments:

1. Report Title: Western Clay Gypsum Mine

2. Development Company: Western Clay Company

3. Report Date: (month) August (w) 29, 1996 (year)

4. Antiquities Permit: No.96UTSC0466b. BLM UT54633

5. Responsible Institution: SENCO-PHENIX County: Uintah

6. Fieldwork Location TWN 24S Range 7E Section(s): 13, 23, 24.

7. Resource Area: San Rafael

PO=Pony Express, BR=Bear River, PR=Price River, WS=Warm Springs
BC=Book Cliffs, HR=House Range, Sevier River, HM=Henry Mountains
BE=Beaver River, DX=Dixie ,KA=Kanab, ES=Escalante, SJ=SanJuan
GR=Grand, SR=San Rafael, DM=Diamond Mountain

V=Vernal Meridian
H=Half Township

8. Description of Examination Procedures: Class III walkover survey with meandering transects no further spaced than 15 meters.

9. Linear Miles Surveyed: and/or Definable Acres Surveyed and/or Undefinable Acres Survey: 80

10. Inventory Type: I
R=Reconnaisance
I=Intensive
S=Statistical Sample

11. Description of Findings (attach appendices, if appropriate)

No cultural resources were located.

12. Number of Sites: 0

13. Collection: N Y=Yes, N=No

14. Actual/Potential National Register Properties Affected: Project will have no effect on any site.

15. Literature Search, Location(s)/Date(s): August 22, 1996 at Antiquities Branch, Division of State History; August 17, 1996 at Price Resource Area of the Bureau of Land Management.

16. Conclusions/Recommendations: No National Register of Historic Places sites will be affected by the proposed project. Archeological clearance is recommended.

17. Signatures

Administrator:

Field Supervisor: John A. Senulis

*For extra locationals use additional 8100-3 forms.

UT 8100-3 (2/85)

UTAH SHPO

COVER SHEET

Project Name: Western Clay Gypsum Mine Block.

State #U96SC0466b

Report Date: August 29, 1996

Principal Investigator: John A. Senulis

Field Supervisor: John A. Senulis

Acreage Surveyed: ca. 80 acres

Intensive Acres: 80 Recon/Intuitive Acres: 10

U.S.G.S. 7.5 Quad: Ireland Mesa, Utah (1983)

Sites Reported	Number	Smithsonian Site #(s):
Archeological Sites:	0	
Revisit (No IMACS update)		
Revisit (IMACS update attch.)		
New Sites (IMACS attached)		
Archeological Site Total:		
Historic Structures:		
(USHS Site Form Attached)		
Total NRHP Eligible Sites	0	

Checklist of Required Items:

1. X 1 Copy of Final Report
2. X Copy of U.S.G.S. 7.5' map showing surveyed/excavated area
3. Completed IMACS Site Inventory Forms Including
   - _____Parts A and B or C
   - _____IMACS Encoding Form
   - _____Site Sketch Map
   - _____Photographs
   - _____Copy of USGS 7.5' Quad with Smithsonian site Number
4. X Completed Cover Sheet

Abstract

An intensive cultural resource survey was performed by John and Jeanne Senulis of SENCO-PHENIX, on the proposed 80 acre Gypsum Mine for Western Clay Company. The purpose of the survey was to identify and evaluate cultural resources which may exist within the project area.

No cultural resources were located and the potential for undetected remains is remote. Archeological clearance without stipulations is recommended.

Project Location

The various parcels were located in Sections 13, 23 and 24, Township 24 South, Range 7 East, Emery County, Utah. The project area was staked with markers every fifty feet. The proposed project is noted on the enclosed copy of U.S.G.S. 7.5' Quad: Ireland Mesa, Utah (1983).

General Environment

The project area is within the Canyon Lands section of the Colorado Plateau Province. The Canyon Lands are composed of tablelands and mesas with gently undulating and rolling topography. The center of the section is bisected by the Colorado River and deep dissected canyons. There are a number of plateaus composed of horizontal sandstone beds capped with desert varnish or basalt sills. Basalt also appears as dikes or hogbacks that have pushed through softer surfaces. Gypsum appears as light gray layers in the formations cut by erosion or as surface protrusions. The deeply dissected landscape witnesses the soft underlying formations.

The midlatitude, semi-arid climate is typically Continental with cold winters and warm summers. Precipitation is directly related to altitude and slope and proximity to the mountain ranges.

Specific Environment

The survey area for the proposed Gypsum mine is located in an area of dissected rolling terrain surrounded by broad high mesas. Soils are very thin silty alluvial and colluvial tan loams with shallow deposits of blow sand on the eastern flanks of low ridges. There are virtually no rocks or gravels on the surface except for fragments of Selenite, the crystal form of Gypsum. Most of the Selenite is transparent although some red (iron), and green (copper) are present. Vegetation is very sparse with some low sagebrush and rabbitbrush and even sparser tuft grasses. There are occasional cactus of various species. Elevation is approximately 5,300 to 5,500 feet. The closest permanent water source is Muddy Creek about ½ mile to the east.

Previous Research

A file search at the Antiquities Section of the Division of Utah State History on August 22, 1996 indicated that no projects had been performed and no sites recorded for Sections 13, 23 and 24, T24S, R7E. A supplemental file search at the Price Resource Areas of the BLM on August 17, 1996, revealed that Blaine Miller of the BLM surveyed a five acre parcel and some access road modifications in Section 23, T24S, R7E in March, 1996. The surveyed area is now the initial workings of the proposed Gypsum mine. No cultural resources were located.

Methodology

A Class III intensive walkover survey was performed by John and Jeanne Senulis of SENCO-PHENIX on August 27, 1996. Meandering transects no further spaced than 15 meters were employed. Special attention was given to those areas of subsurface soil exposure from animal burrowing, erosion and construction.

Survey conditions were generally good with mostly and partly sunny skies and light to moderate westerly breezes. The temperature was in the mid 80s and the soils were dry.

All field notes and photograph negatives are on file at the offices of SENCO-PHENIX in Mount Pleasant, Utah.

Findings and Recommendations

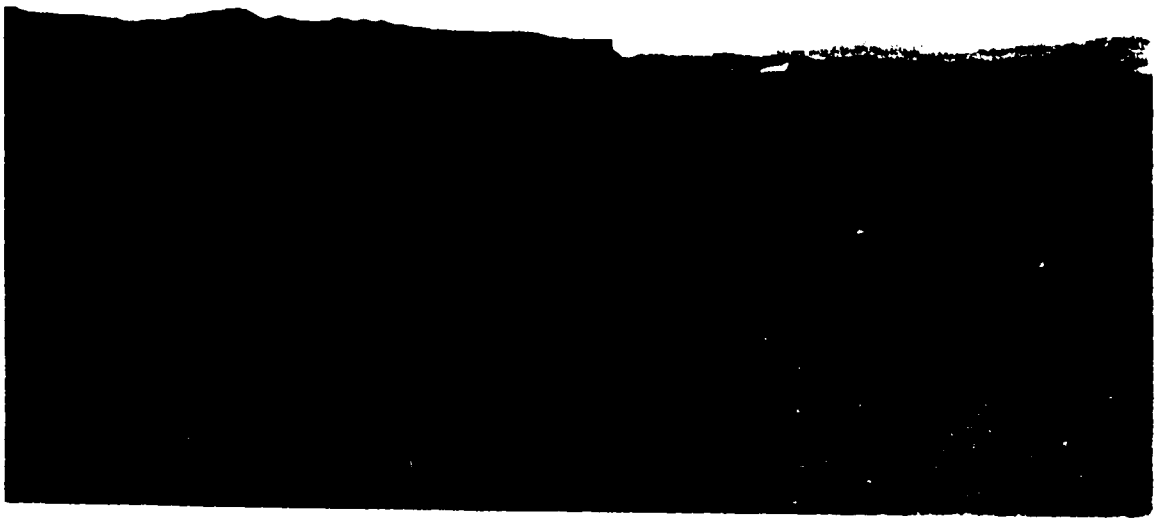
No cultural resources were located and the potential for undetected remains is remote. Archeological clearance without stipulations is recommended.

These recommendations are subject to modification and review by the BLM Price Resource Area Manager and the Utah SHPO.

U.S.G.S. 7.5' Quad: Ireland Mesa, Utah (1983)

Gypsum Mine Prospect
Western Clay Company
Sections 13, 23, 24, T24S, R7E.
Emery County, Utah
SP-UT-187
August 29, 1996

SENCO—PHENIX



View West of Main Project Area

View Southwest of Main Project Area

COPY

SENCO-PHENIX

September 5, 1996

Mr. Blaine Miller
Bureau of Land Management
Price River Resource Area
125 South, 600 West
Price, Utah 84501

RE: Western Clay Company Gypsum Mine Report (SPUT-187; U96SC0466b)

Dear Blaine:

I have been notified of some minor changes to the plan for the Western Clay Company Gypsum mine. They concern an extension of the permit area in the extreme NE ¼ of Section 23, T24S, R7E and the connecting area between Sections 23 and 24. The changes involve an addition of about 4 acres. We covered both of these areas during our survey. We covered the ground for the first one to assure we were in the right section, which involved hunting for the section marker. The connecting segment between the two sections was unstaked when we first arrived so we covered a broad area to assure we were in the right location. After it was staked it was obvious that we covered more ground then was necessary.

Despite the minor changes we feel that the two areas were covered in the initial survey. Secondly the general area has a very low probability for archeological site location. We stand by our recommendation for archeological clearance without stipulation as stated in our initial report.

Thank you for your attention.

Sincerely,

John A. Senulis

John A. Senulis
Principal Investigator

cc: Wally Curtis, Western Clay

P.O. BOX 162, MOUNT PLEASANT, UTAH 84647 • PHONE 801-462-0291 • FAX 801 462-0292 • ARCHEOLOGICAL CONSULTING SERVICES

CONTRIBUTING WATERSHED AND PEAK FLOW CALCULATION AND MAP

Water crossing in area C-2

Hydrograph type= S.D.S RUNOFF	Peak Discharge = 29.81 cfs
Storm frequency= 28 yr	Time interval = 30 min
Basin area= 46 acrs	Basin curve No.= 96
Ave basin slope= 4%	Hydrolic len= 2000 feet
Basin lag = 9.8 min	Time of concern= 26.53 min
Total precip = 1.70 in	Distribution= S.C.S. III

HYDROGRAPH DISCHARGE TABLE

TIME HRS	OUTFLOW CFS	TIME HRS	OUTFLOW CFS	TIME HRS	OUTFLOW CFS	TIME HRS	OUTFLOW CFS
8.50	0.69	9.00	0.97	9.5	1.34	10.00	1.77
10.50	2.35	11.00	3.18	11.53	4.83	12.32	20.12
12.5	29.81	13.00	18.44	13.50	6.14	14.00	4.76
14.50	3.98	15.00	3.45	15.5	2.99	16.00	2.52
16.5	2.25	17.00	1.98	17.5	1.70	18.00	1.49
18.50	2.83	19.00	1.25	19.5	1.19	20.00	1.13
20.5	1.07	21.00	1.01	21.60	0.94	22.00	8.88

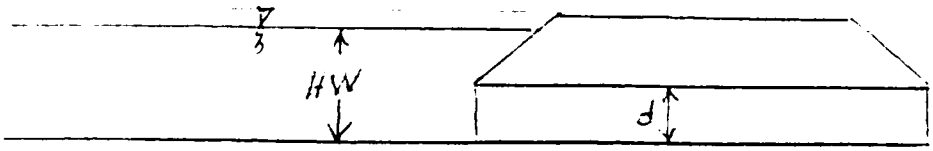
WATER CROSSING ON AREA D

HYDROGRAPH TYPE =	S.C.S RUNOFF	Peak discharge = 118.58 cfs	
Storm Frequency	=	28 yr	Time interval = 30 min
Basin area	=	193 ac	Basin curve no = 95
Ave basin slope	=	3 %	Hydrolic len = 4000 ft
Basin lag	=	18.7 min	Time of concern= 31.17 min
Total precip	=	1.70 in	Distribution= S.C.S III

HYDROGRAPH DISCHARGE TABLE

TIME HRS	OUTFLOW CFS	TIME HRS	OUTFLOW CFS	TIME HRS	OUTFLOW CFS	TIME HRS	OUTFLOW CFS
6.50	0.42	7.00	0.81	7.50	1.30	8.00	1.90
8.50	2.71	9.00	3.87	9.50	5.34	10.00	7.34
18.5	9.37	11.00	12.63	11.5	19.23	12.00	80.03
12.50	118.58	13.00	61.40	13.50	24.44	14.00	18.95
14.60	18.35	15.00	13.71	15.50	11.23	16.00	10.04
16.50	18.53	17.00	7.56	17.50	6.74	18.00	5.98
18.50	5.32	19.00	4.97	19.5	4.73	20.00	4.49
20.5	4.24	21.00	4.00	21.5	3.75	22.00	3.51
22.5	3.78	23.00	3.58	23.5	3.15	24.00	2.97

12-5-16
CEC



1- Small Basin - 30 cfs - inlet control

d	Hw/D	Hw
24"	3.1	6.2
30"	1.45	3.6
36"	1.0	3.0

2- Large Basin - 120 cfs - inlet control

	d	Hw/D	Hw	
	48"	1.8	7.2	
(2)	42"	1.25	4.4	60 cfs ea
(2)	36"	1.9	5.7	" "

We wish only to use a culvert in the small basin drainage.

A low water crossing will work well in the large basin drainage.

11/27/96

HYDROLOGIC REPORT

[illegible] .... Larger Basin
....
....

Hyd. No. 3

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 118.59 cfs
Storm frequency	= [illegible] yr	Time interval	= 30 min
Drain. area	= [illegible] ac	Basin curve No.	= 95
Basin slope	= [illegible]	Hydraulic len	= 4000 ft
Basin lag	= [illegible] min	Time of concen	= 31.1[illegible] min
Total precip	= [illegible] in	Distribution	= S.C.S. [illegible]

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs	cfs)	TIME--OUTFLOW (hrs	cfs)	TIME--OUTFLOW (hrs	cfs)	TIME--OUTFLOW (hrs	cfs)
[illegible]	0.40	7.00	0.81	7.50	1.30	8.00	1.90
[illegible]	2.71	9.00	3.87	9.50	5.34	10.00	7.34
[illegible]	9.37	11.00	12.63	11.50	19.23	12.00	80.03
[illegible]	118.59	13.00	61.40	13.50	24.44	14.00	18.95
[illegible]	15.25	15.00	13.7[illegible]	15.50	11.93	16.00	10.04
[illegible]	8.53	17.00	7.55	17.50	6.74	18.00	5.93
[illegible]	5.31	19.00	4.97	19.50	4.73	20.00	4.49
[illegible]	4.24	21.00	4.00	21.50	3.78	22.00	3.51
[illegible]	3.79	23.00	3.50	23.50	3.13	24.00	2.97

11/27/14

HYDROLOGIC REPORT

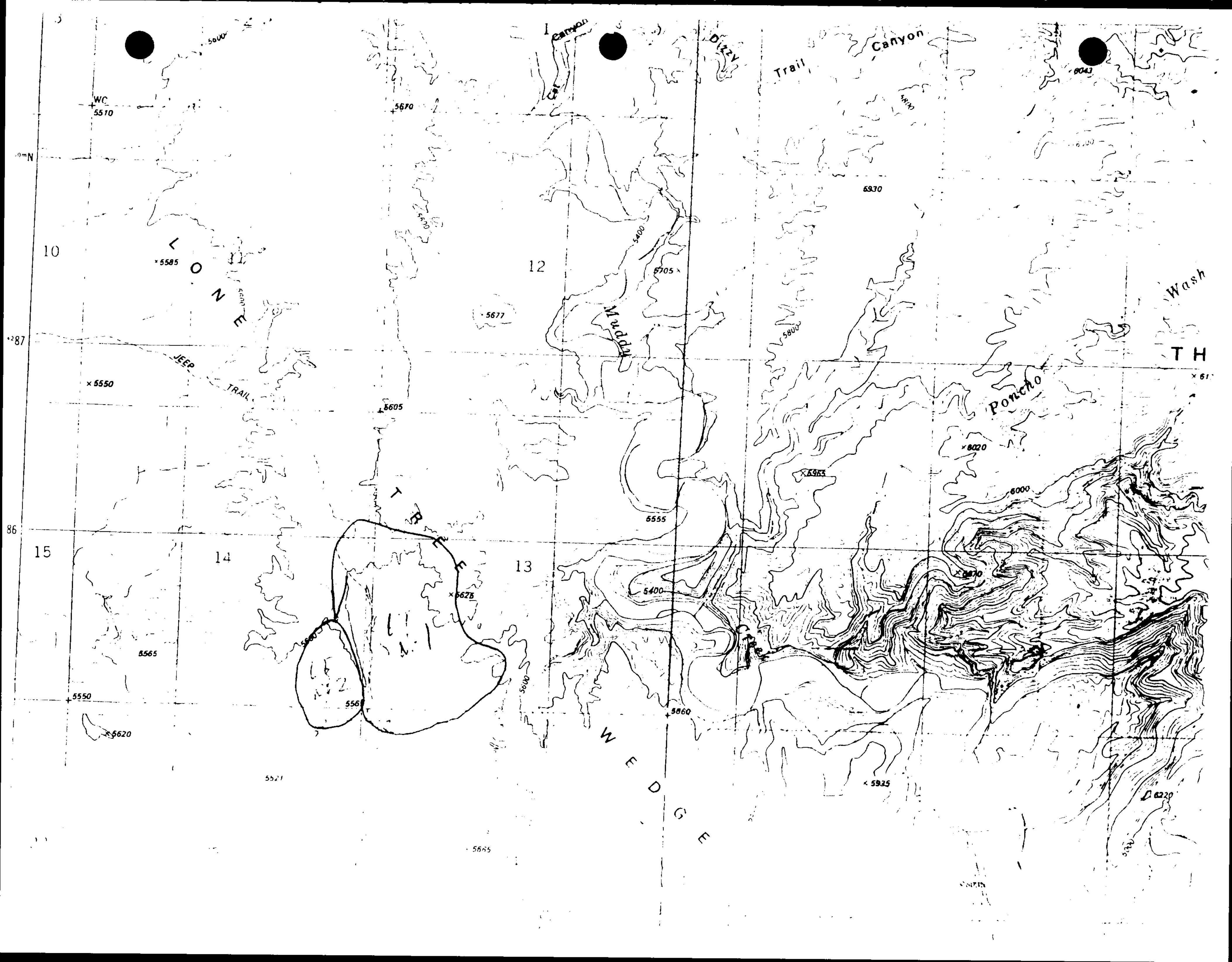
LT NO2.....
.....
.....

Hyd. No. 4

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 39.31 cfs
Storm frequency	= 25 yr	Time interval	= 5. min
Basin area	= 46 ac	Basin curve No.	= 85
Ave basin slope	= 4 %	Hydraulic len	= 2100 ft
Basin lag	= 9.0 min	Time of concen	= 15.50 min
Total precip	= 4.70 in	Distribution	= S.C.S. III

HYDROGRAPH DISCHARGE TABLE

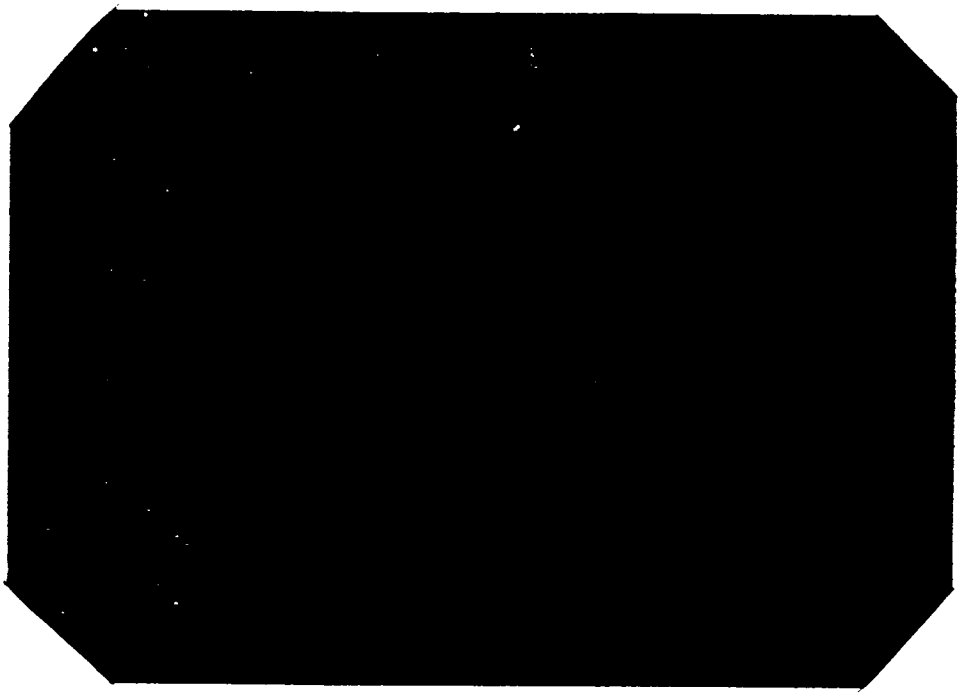
TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
8.50	0.68	9.00	0.97	9.50	1.34	10.00	1.77
10.50	2.35	11.00	3.19	11.50	4.83	12.00	20.12
12.50	29.21	13.00	15.44	13.50	6.14	14.00	4.76
14.50	3.99	15.00	3.45	15.50	2.99	16.00	2.62
16.50	2.15	17.00	1.90	17.50	1.70	18.00	1.49
18.50	1.33	19.00	1.20	19.50	1.09	20.00	1.00
20.50	1.07	21.00	1.01	21.50	0.94	22.00	0.88



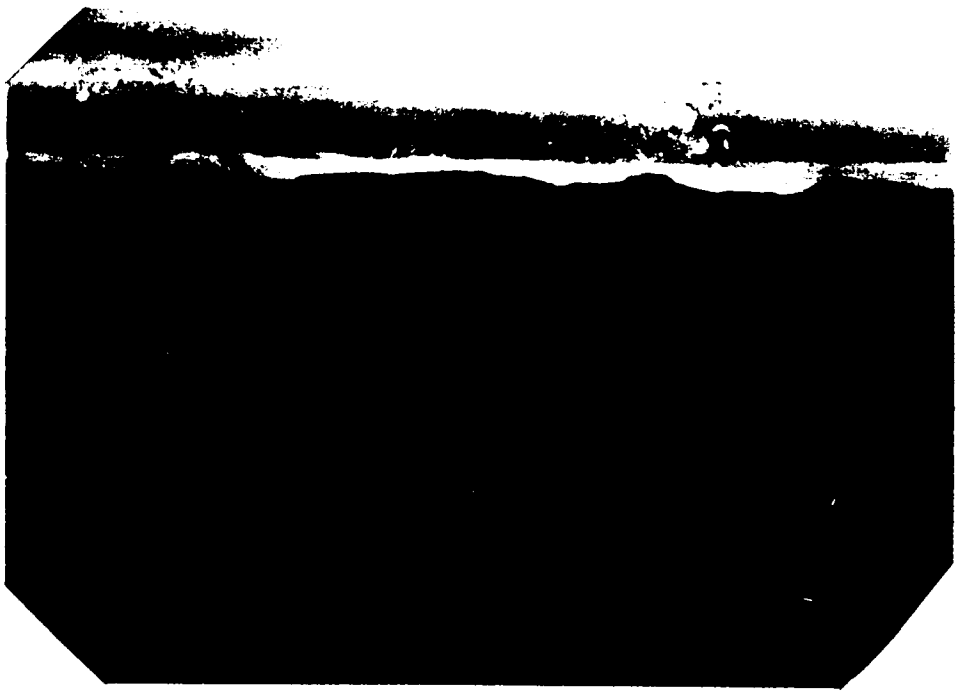
LONE TREE WEDGE
Dizzy Trail Canyon
Muddy Creek
Poncho Wash
JEEP TRAIL
WC 5510
5670
5585
5550
5605
5677
5705
5555
5860
5400
5800
6930
5965
6020
6000
5935
6220
6043
5626
5565
5550
5620
5665
10
11
12
13
14
15

CROSS SECTION OF DRAINAGES DEPICTING THEIR NATURAL STATE

G. Proposed wash crossing in Area C-2, Western Clay Company, Proposed Plan of Operations UTU-73779 in T.24S., R.7E., Section 23, 12-5-96.

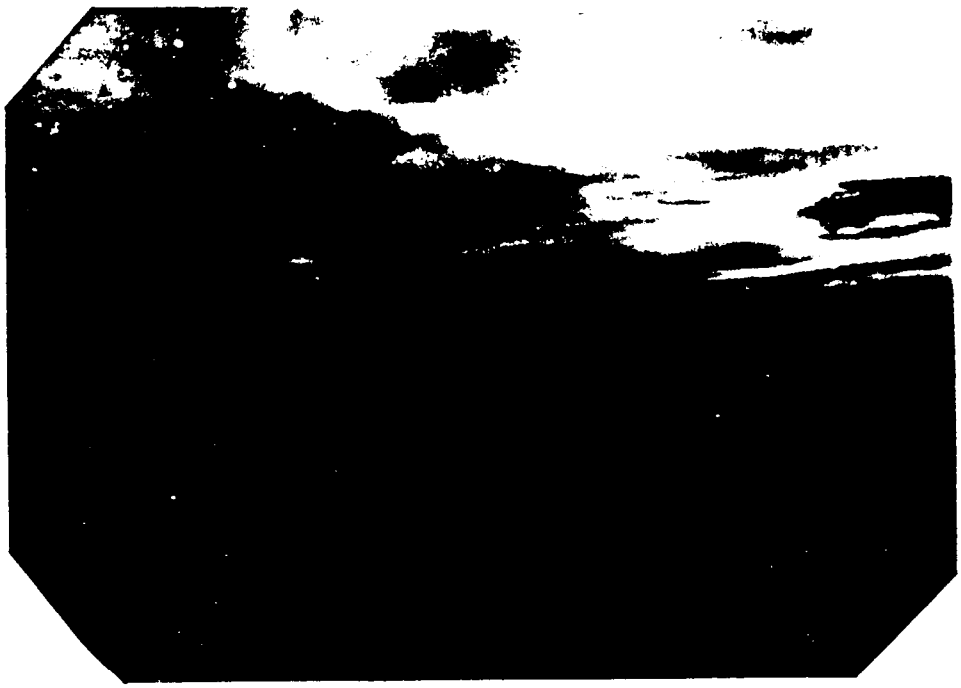


H. Existing ATV trail in Area C-2, Western Clay Company, Proposed Plan of Operations UTU-73779 in T.24S., R.7E., Section 23. 12-5-96.



E. Area C-2, Western Clay Company, Proposed Plan of Operations, UTU-73779 in T.24S., R.7E., Section 23, 12-5-96.

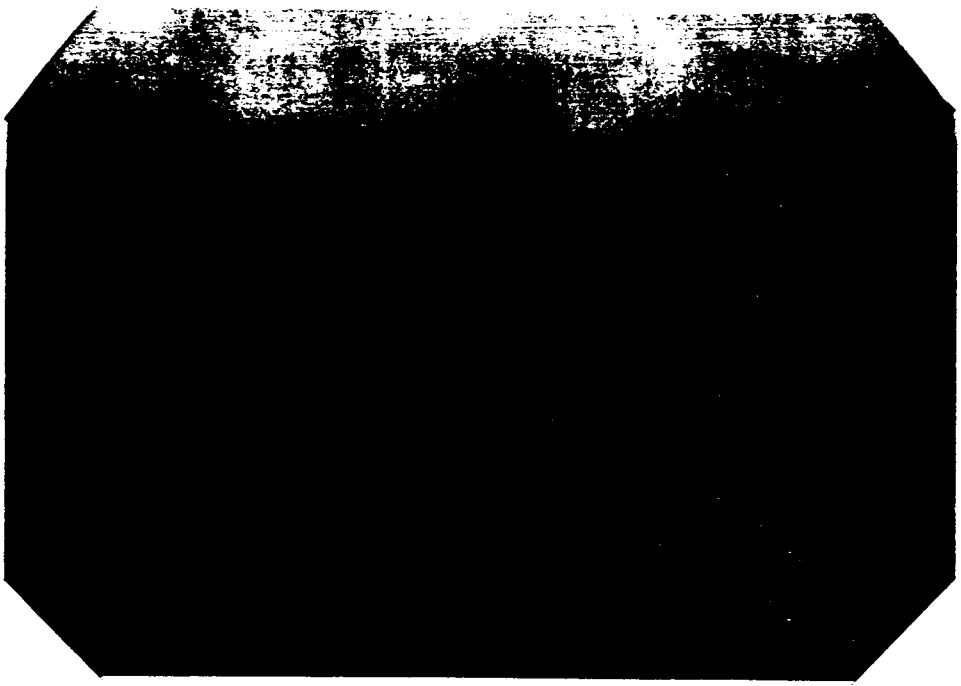
F. Existing drainage in Area C-2, Western Clay Company, Proposed Plan of Operations UTU-73779 in T.24S., R.7E., Section 23, 12-5-96.



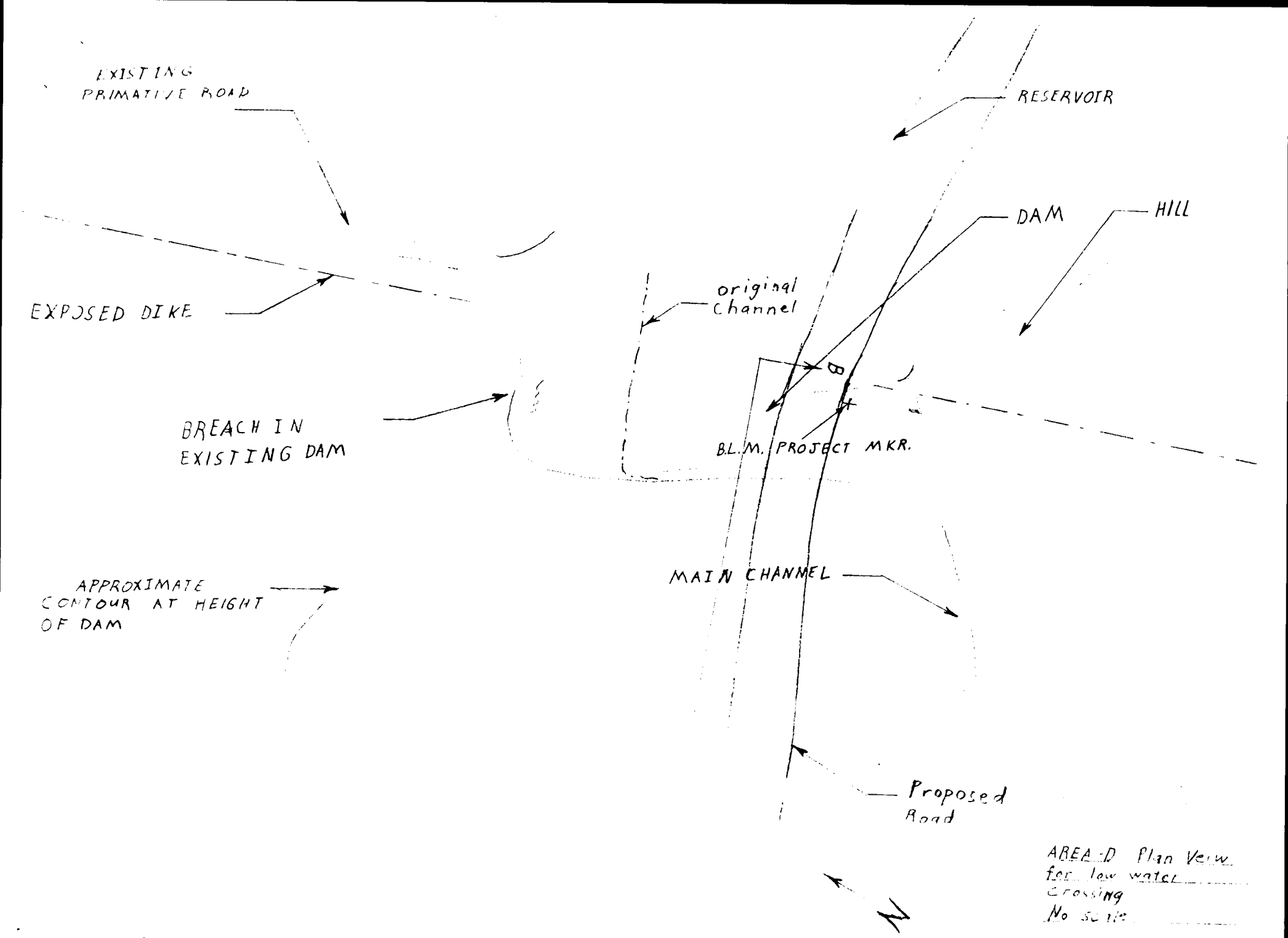
C. Entrance to Lone Tree Wedge gypsum mine, Western Clay Company, notice UTU-73779 in T.24S., R.7E., Section 23, 12-5-96.

D. Lone Tree Wedge gypsum mine, Western Clay Company, notice UTU-73779 in T.24S., R.7E., Section 23, 12-5-96.

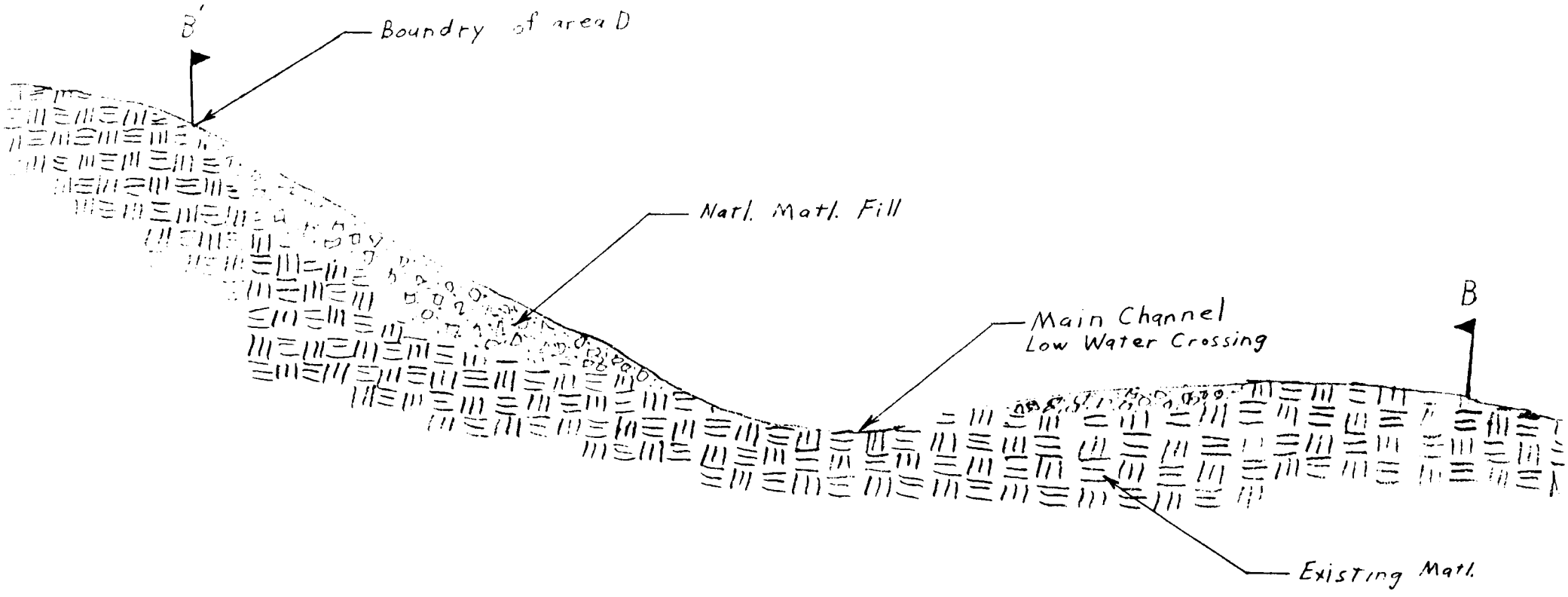
A. Sign adjacent to access road, Western Clay Company, 12-5-96.



B. Another sign adjacent to the access road, Western Clay Company, 12-5-96.



AREA-D Plan View
for low water
Crossing
No scale



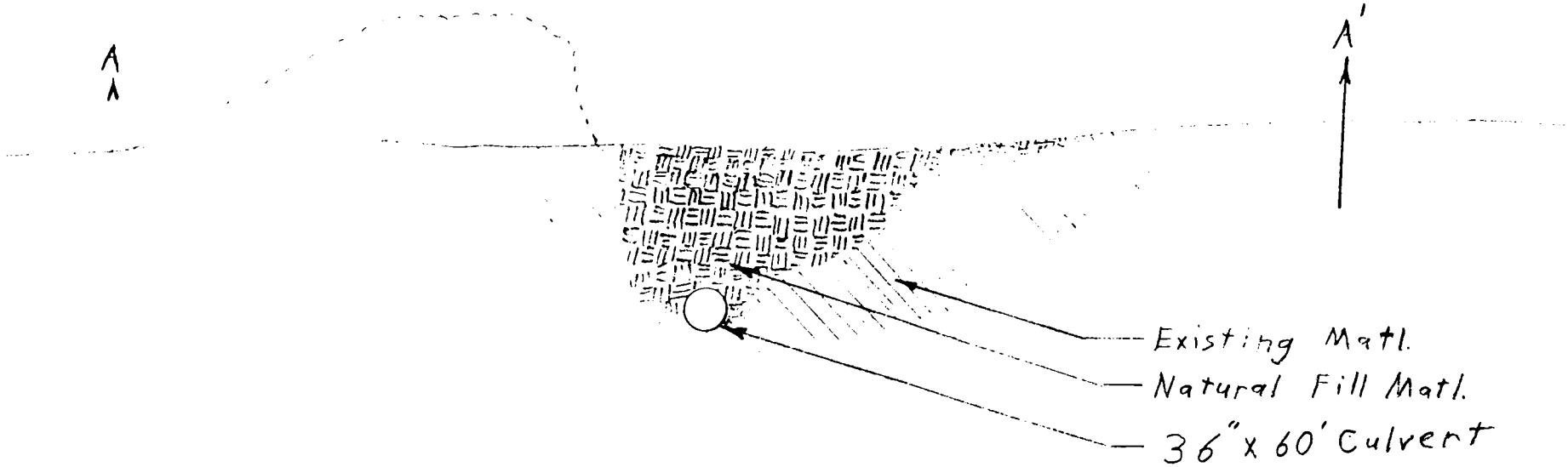
South section view

AREA-D Cross section of Roadway and Low water crossing
No scale

South section

AREA - D Cross section of Proposed Roadway

No scale



West section veiw

A-A Proposed Fill

No Scale

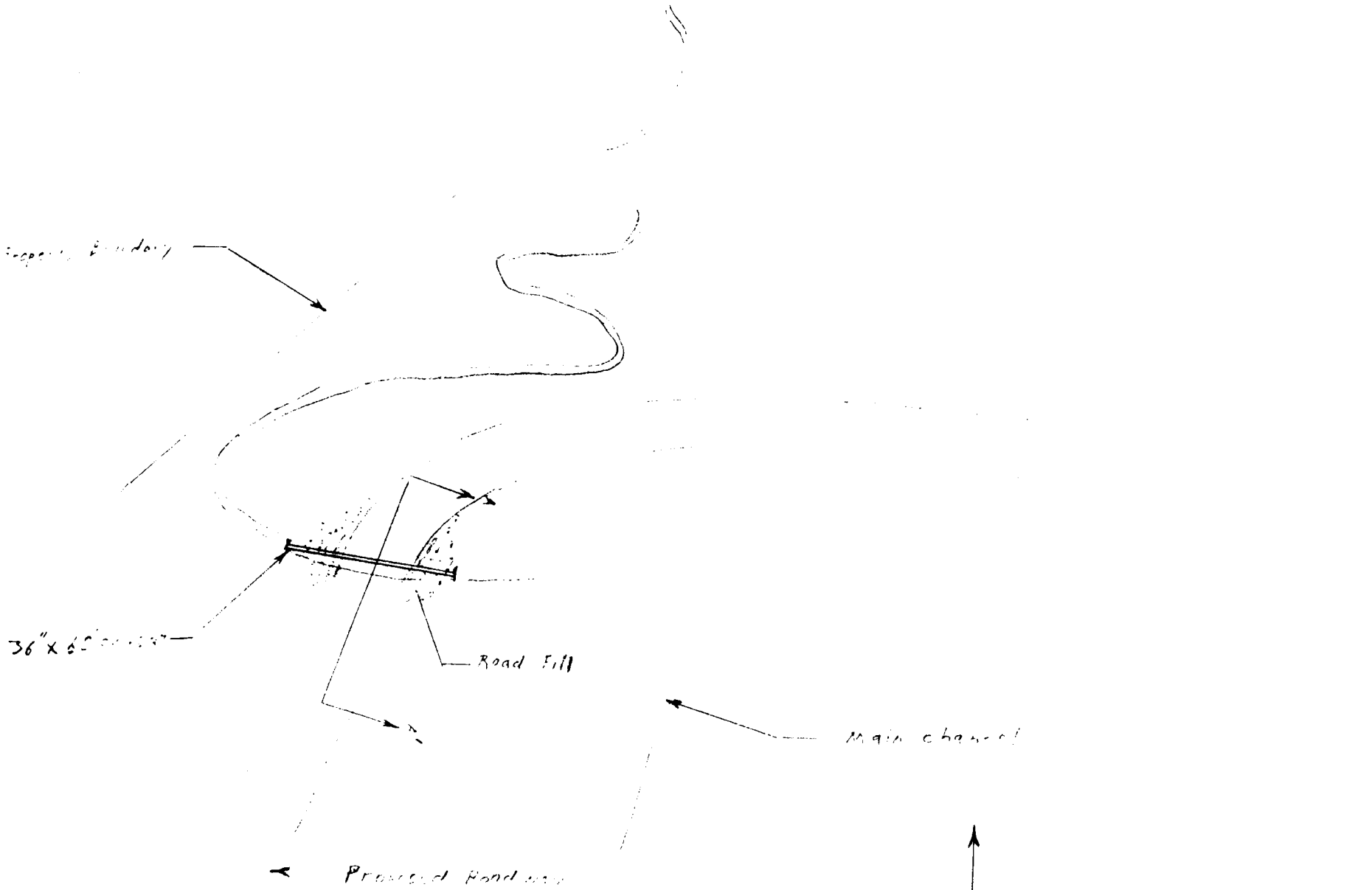
Note: Approximate depth of fill

Sloped sides of fill will be covered with natural rocks for erosion protection

West section view

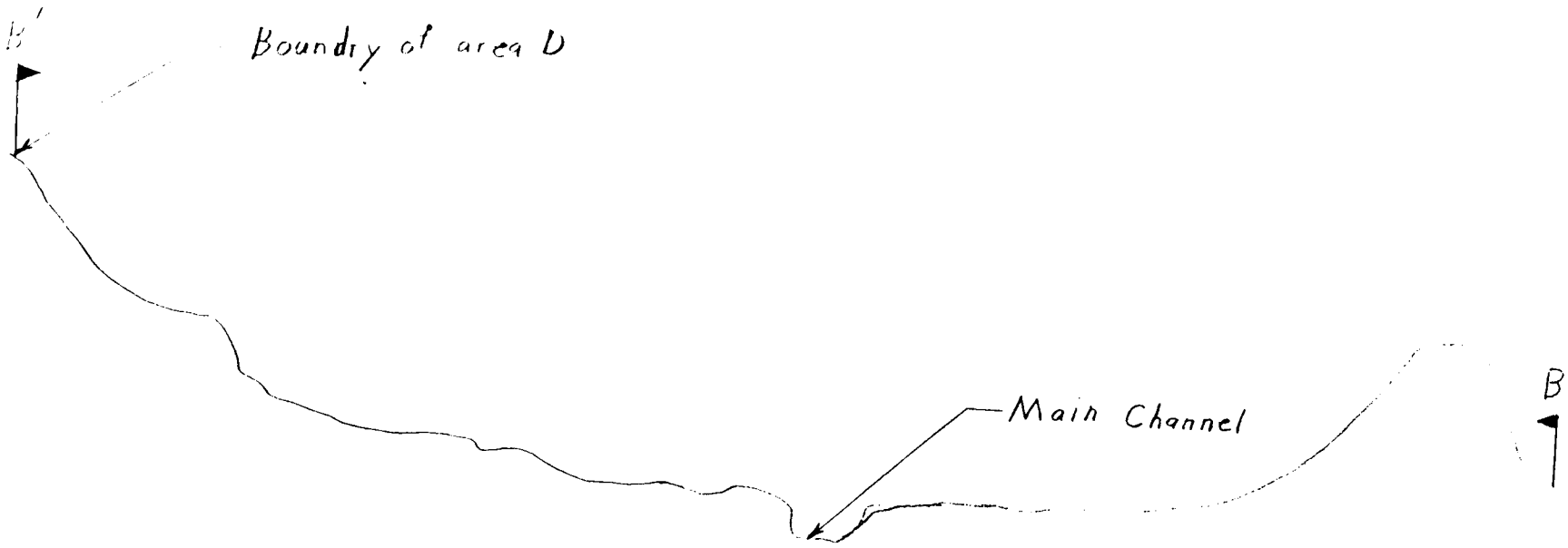
A-A Existing gully

No Scale



A-A Plan View

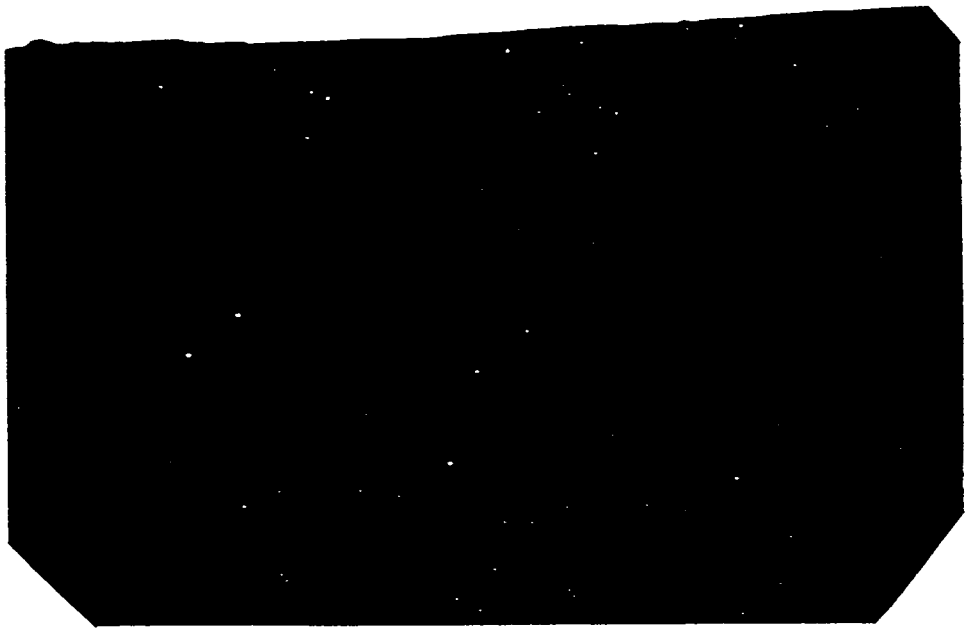
No Scale



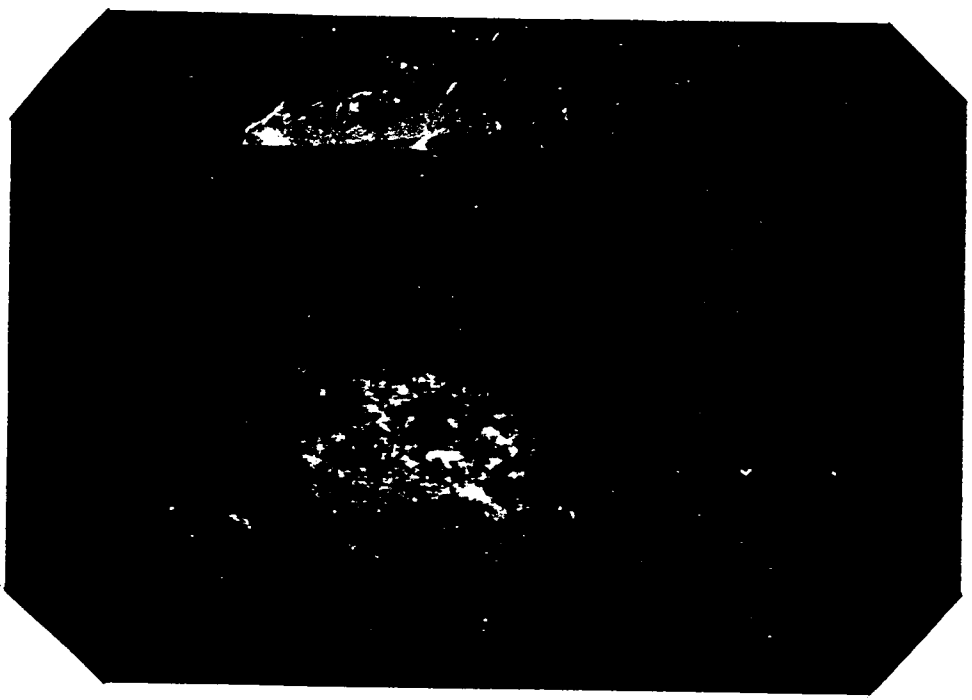
South section

AREA - D. Cross section of Proposed Railway

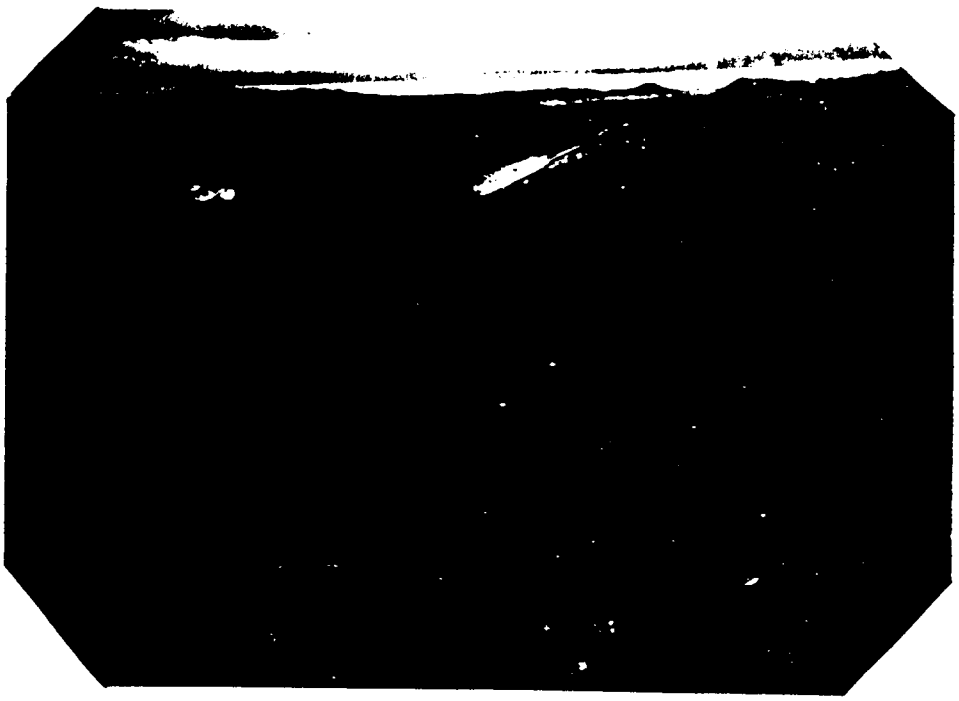
No scale



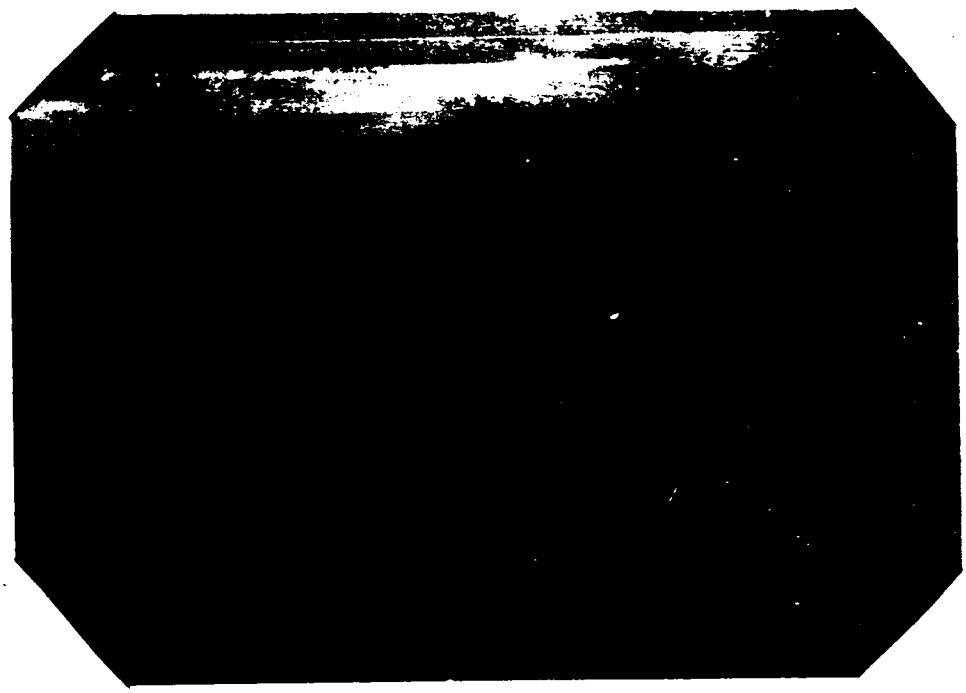
I. Proposed wash crossing in Area D, Western Clay Company, Proposed Plan of Operations in T.24S., R.7E., Section 24, 12-5-96.



J. Vegetation including cryptogamic soils in Area D, Western Clay Company, Proposed Plan of Operations UTU-73779 in T.24S., R.7E., Section 24, 12-5-96.

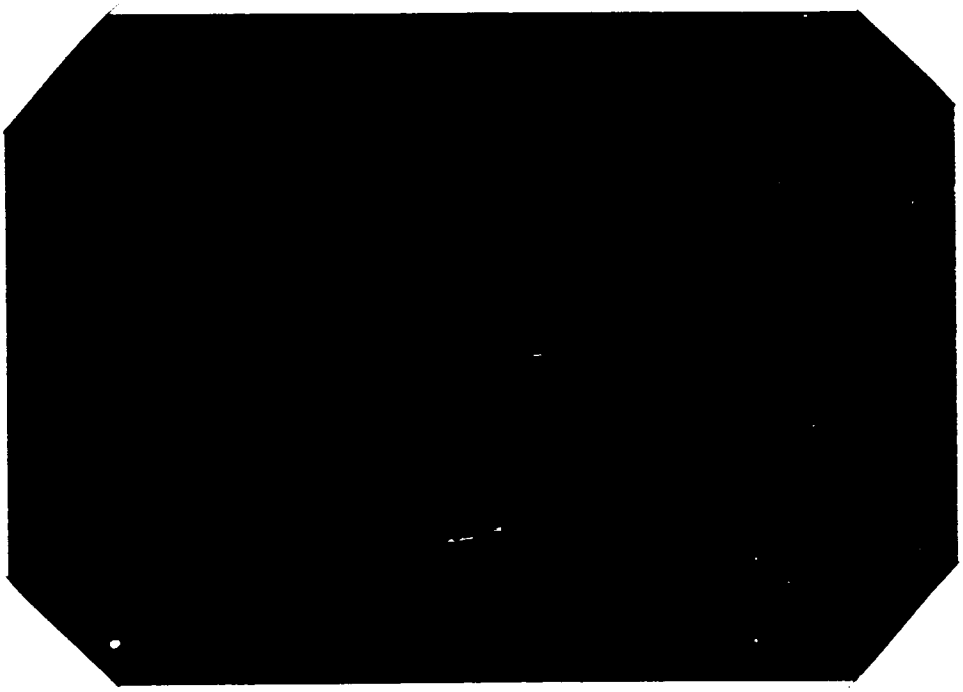


K. Breached dam in Area E, Western Clay Company, Proposed Plan of Operations UTU-73779 in T.24S., R.7E., Section 24, 12-5-96.

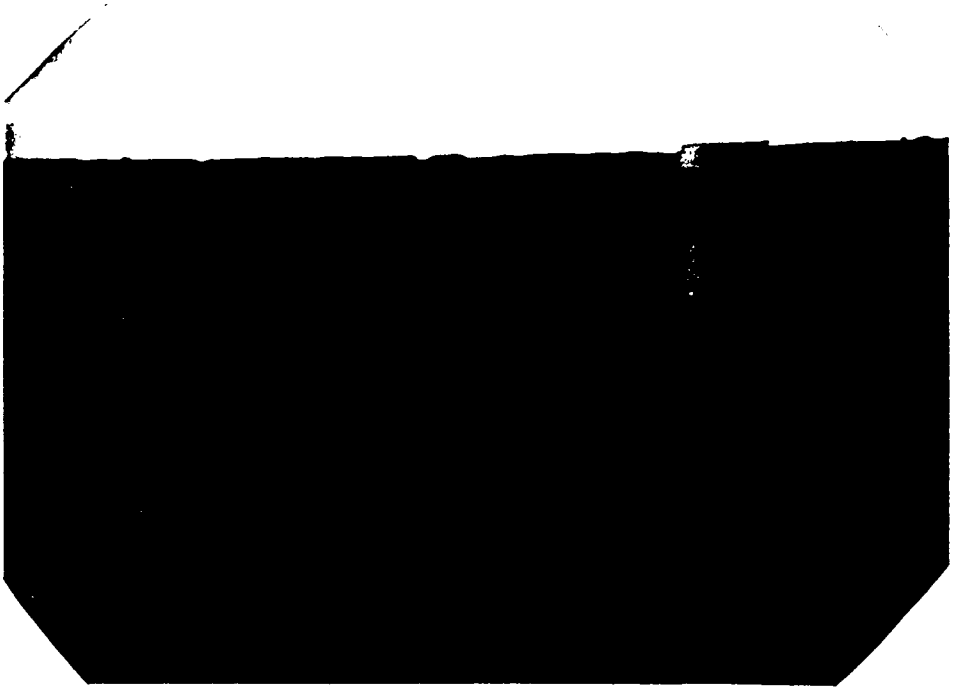


L. Area E, Western Clay Company, Proposed Plan of Operations in T.24S., R.7E., Section 24, 12-5-96.

M. ATV trail and dike in Area , Western Clay Company, Proposed Plan of Operations UTU-73779 in T.24S., R.7E., Section 24, 12-5-96.



N. Endangered Wright's fishhook cactus in the proposed expansion area, Western Clay Company, Proposed Plan of Operations, UTU-73779, 12-5-96.



O. Gypsum bed outcrops west of the Hebe #4 discovery monument, which is south of the proposed mine in T.24S., R.7E., Section 23, 12-5-96.

P. Gypsum bed outcrops east of Hebe #4 discovery monument, which is south of the proposed mine in T24S., R.7E., Section 23. 12-5-96.

12

ATTACHMENT # 4

geologic cross section

Upper Bed of Gypsum Apprx. 10ft.

Low Grade Gypsum Apprx. 10ft.

Non Mineral Apprx. 6-8ft.

Apprx 4ft Gypsum Unknown Purity

Apprx 33ft. Non-Mineral

Lower Bed of Gypsum 12-17ft

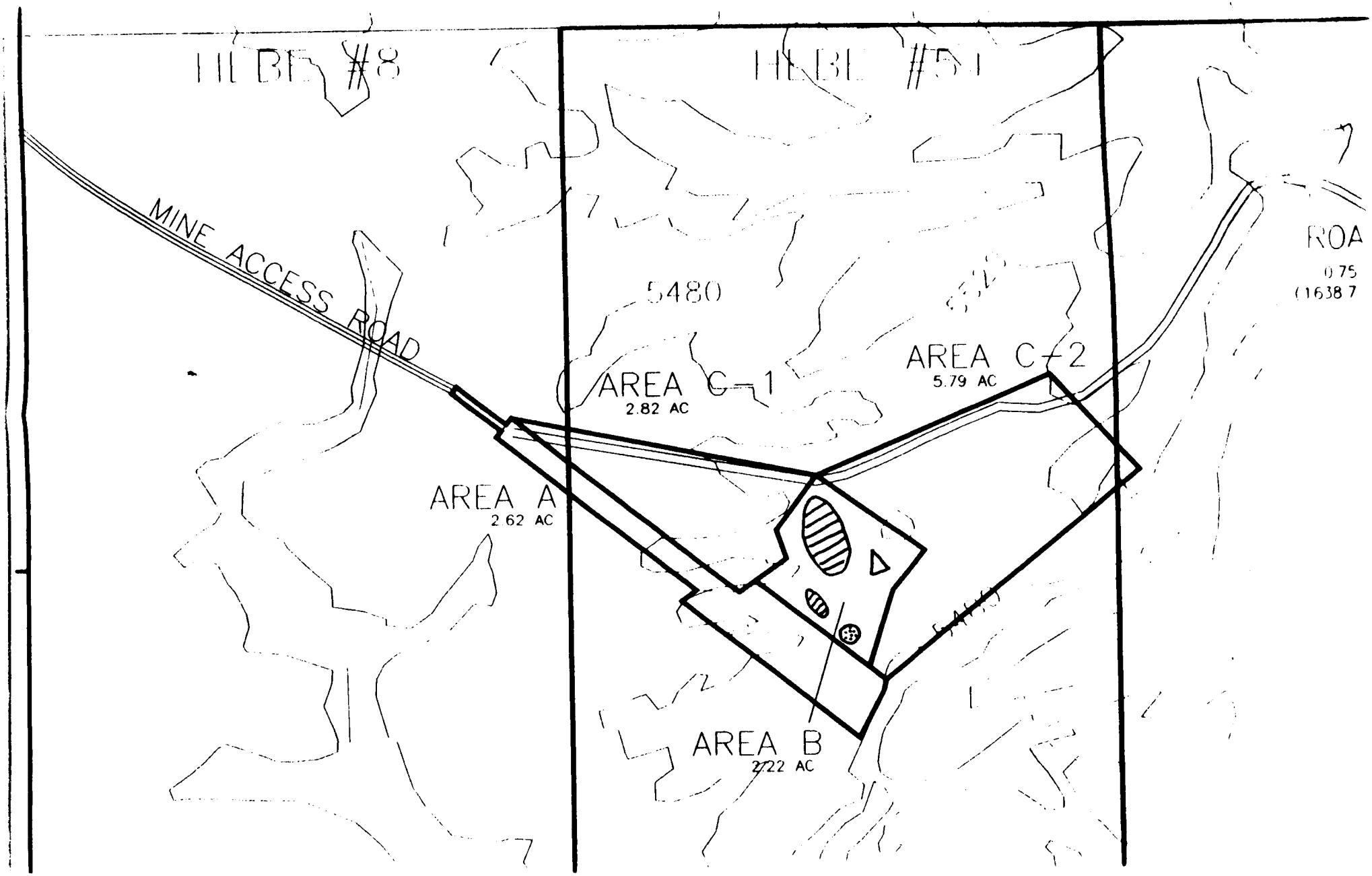
RECCOMENDED SEED MIX

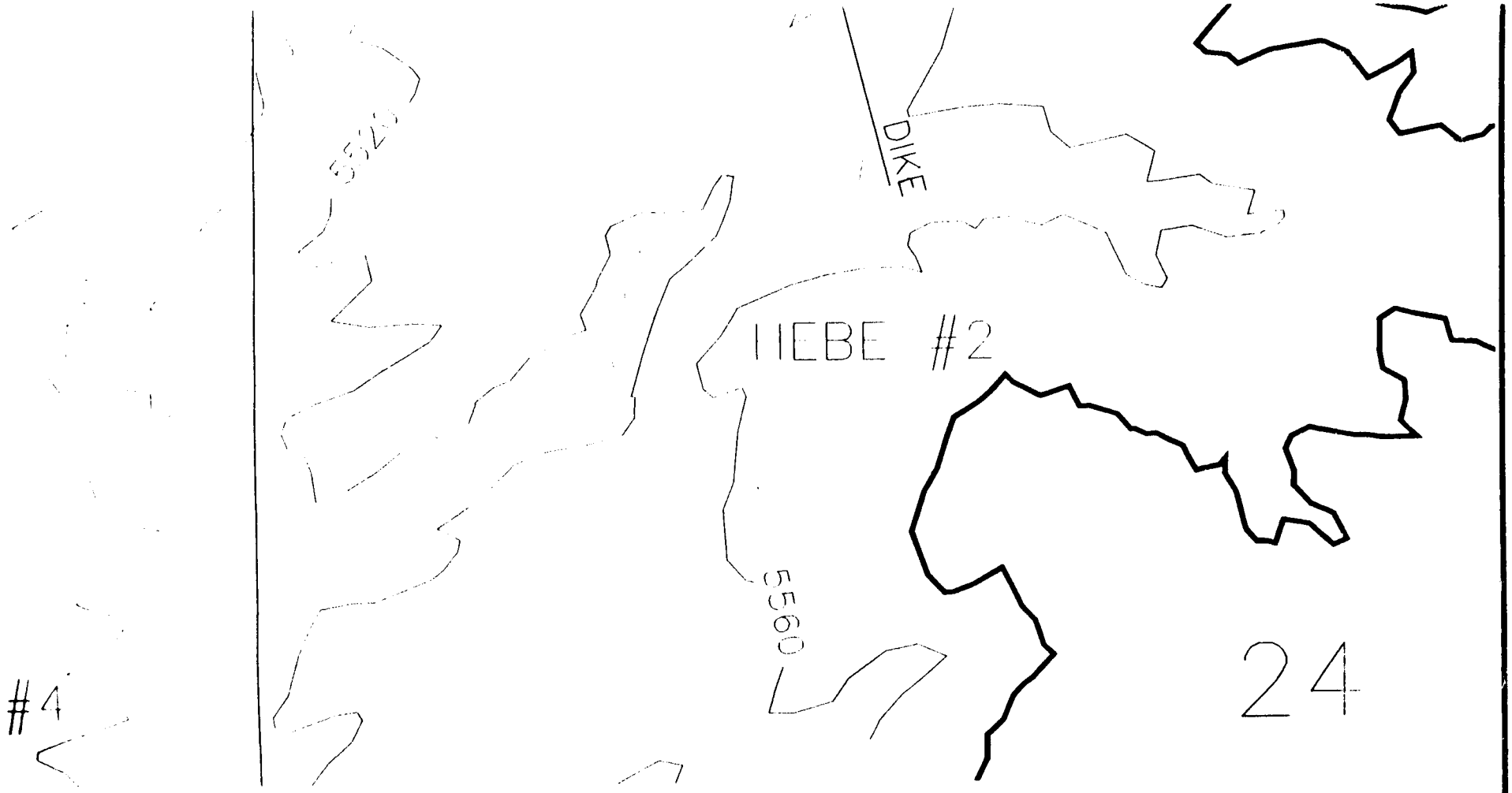
This seed mix was reccomended by BLM for Right of way if another mix is deemed more appropriate by BLM in the future that mix will be used.

Species name	Seeding Rate(Lbs/live seed acre)
Ephedra torreyana	1.00
Kochia prostrata	1.00
Melilotus officinalis	1.00
Oryzopsis hymenoides	2.00
Hilaria jamesii	2.00
Total	14.00 (rates will be doubled as broadcast method is being used)

MAP SHOWING LOCATION OF OPERATIONS IN RELATION TO NEAREST HIGHWAY

Mine
SAN RAFAEL


MINE ACCESS ROAD
AREA A
2.62 AC
AREA C-1
2.82 AC
AREA C-2
5.79 AC
AREA B
2.22 AC
5480

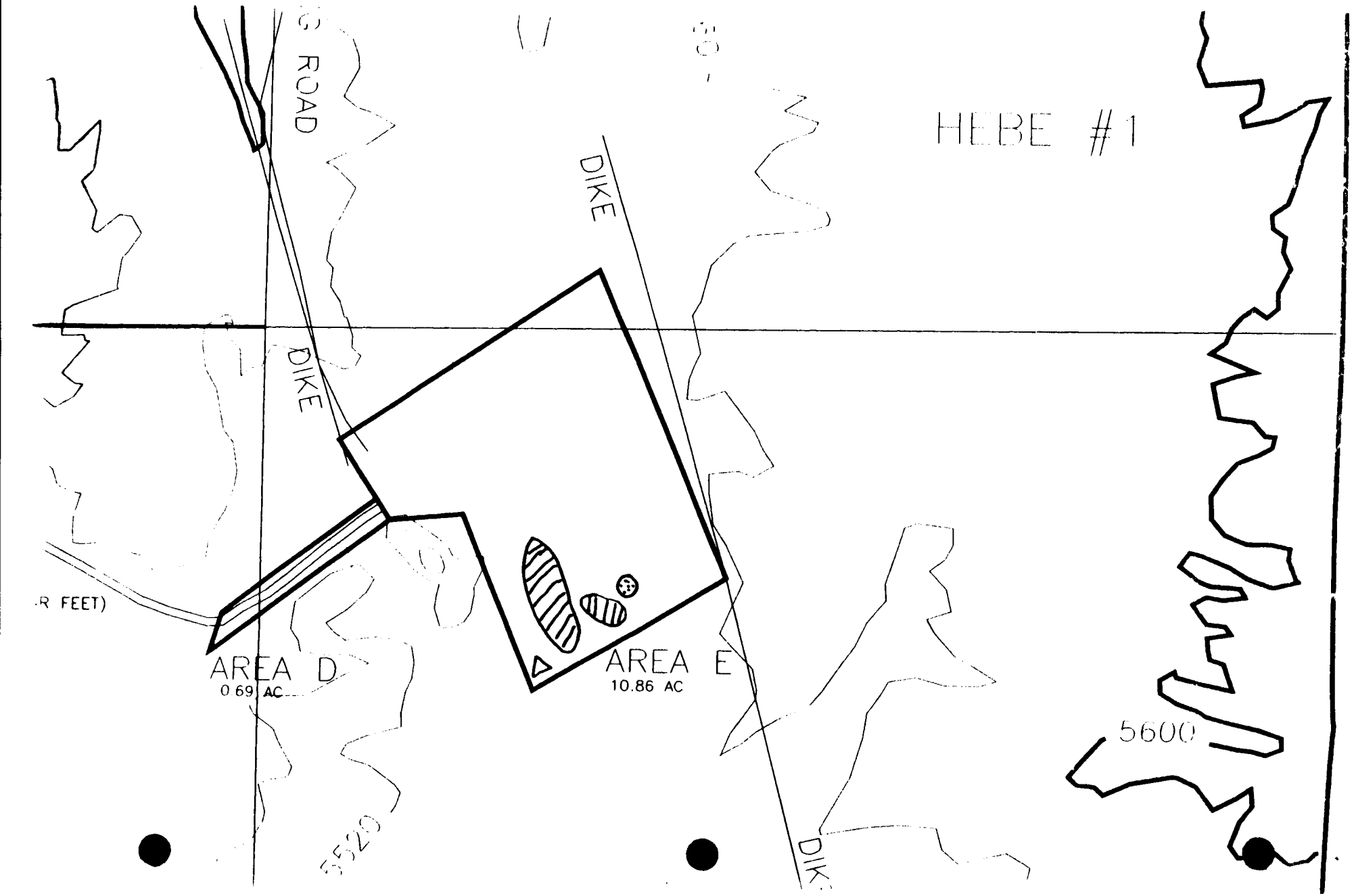


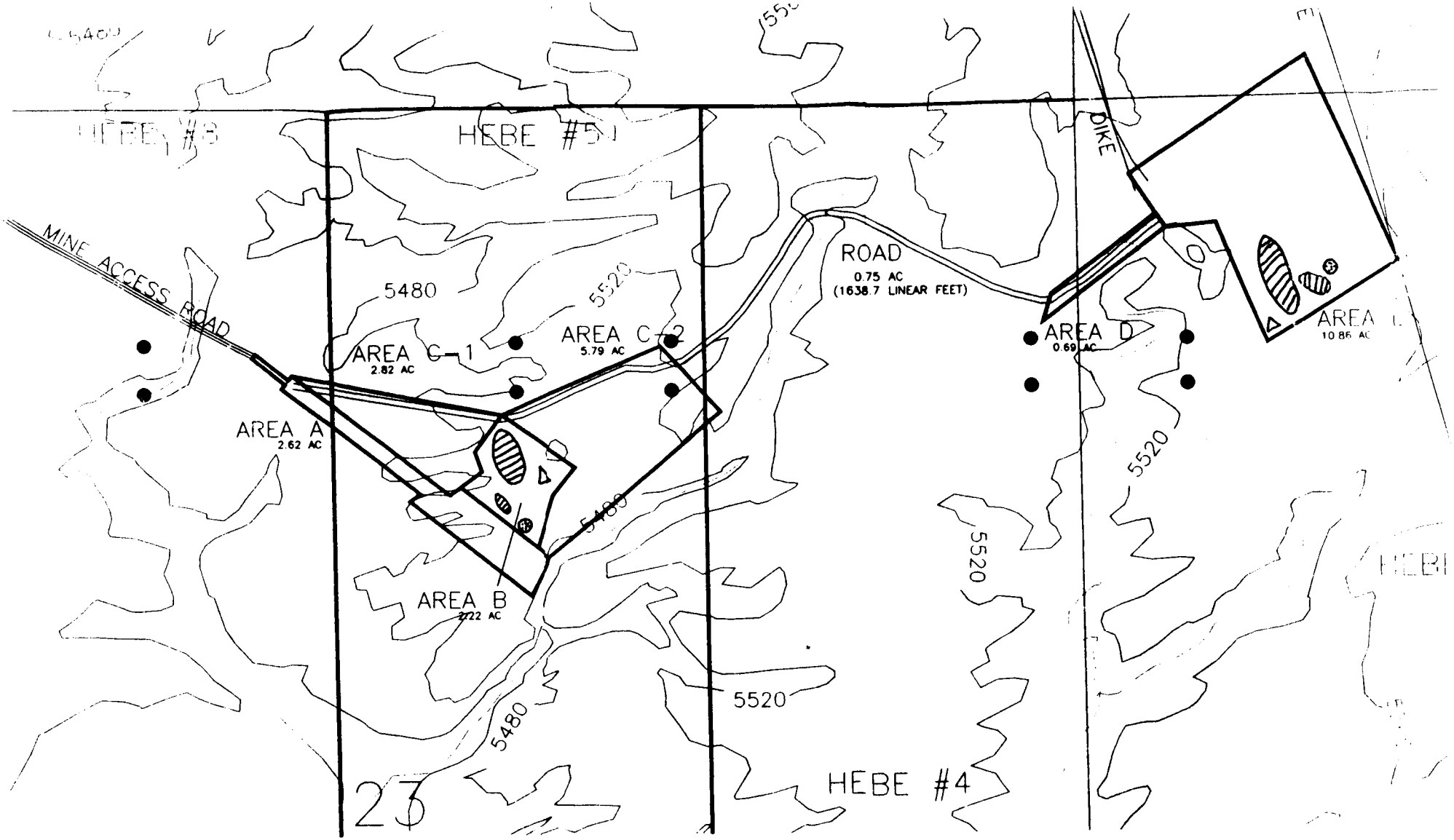
- Overburden storage
- Equipment Storage
- Cryptogam Storage
- Topsoil Storage

WESTERN CLAY COMPANY

PLAN OF OPERATIONS-B
HEBE MINING CLAIMS

DATE SEPT. 8, 1997	SCALE 1"=200'
[illegible]	DRAWING NO


HEBE #1
ROAD
DIKE
DIKE
AREA D
0.69 AC
AREA E
10.86 AC
5600
5520
R FEET)


HEBE #5
DIKE
MINE ACCESS ROAD
ROAD
0.75 AC
(1638.7 LINEAR FEET)
5480
5520
AREA C-1
2.82 AC
AREA C-2
5.79 AC
AREA D
0.69 AC
AREA
10.86 AC
AREA A
2.62 AC
AREA B
2.22 AC
5520
5480
5520
5520
5480
HEBE #4
23

ADDITION TO PAGE # 6

Blasting agents, including dynamite, amfo, caps, etc. will be used in this mine. They will be transported to and from the site by personnel with Hazardous Material transportation training and appropriate drivers licenses. There will be no blasting agents stored on the site. Any contaminated soil will be properly disposed of.

Other Additions:

The no-trespassing sign at the entrance to the mine will be changed to read Keep Out.

The road on the proposed mining areas will be 30 ft wide and will vary in length due to concurrent reclamation.

PROPOSED TRIAL FOR TRANSPLANTING ENDANGERED CACTI

Western Clay would like to propose the following plan for preserving the cacti on this mine area. As a new area is disturbed the cacti located on that area will be transplanted on to freshly reclaimed areas of the mine-site. What we hope to accomplish with this trial would be that very shortly after a cactus is disturbed it will be re-planted on a freshly reclaimed area. This concurrent re-planting will be possible since we will be pursuing a plan of concurrent reclamation. This plan would minimize the time that the cacti are uprooted and stockpiled.

We feel that re-planting the cacti as quickly as possible will facilitate the least possible impact to the population of endangered cacti in the sanrafael.

If this trial does not prove to be as efficient as we hope it will we will revert back to planting the cacti as the last stage of reclamation.

Appendix B

File Code 3809

CHECKLIST FOR ENVIRONMENTAL ASSESSMENT

Applicant Western Clay Company
Address P.O. Box 127
Aurora, UT 84620
EA Preparation Date
Project Title Lone Tree Wedge Gypsum Mine/Plan of Operations
Project Location T. 24S, R7E, Section 13, S½S½SW¼, Section 23, N½, Section 24, N½NW¼
Proposed Action: Approve Western Clay Company's plan of operations of the expansion of an existing gypsum Mine.

Lease/Serial No. UTU-73779
BLM Office Price River/San Rafael RA
Location Price, Utah
EA No. UT-066-97-08

The following mandatory items have been considered for this environmental assessment. Items that may be impacted have been discussed within the environmental assessment; the remainder will not be affected and are not discussed.

		May Be Impacted	Will Not Be Affected		Specialist Signature/Date
1.	a.	[✓]	[ ]	Threatened or Endangered Plants	W Ludington 2/19/97
	b.	[ ]	[✓]	Threatened or Endangered Animals	W Ludington 2/19/97
2.		[ ]	[X]	Areas of Critical Environmental Concern	2-10-97
3.		[ ]	[X]	Cultural or Historic Resources	Blaine Miller 2-10-97
4.		[ ]	[X]	Floodplains and Wetlands	2/18/97
5.		[X]	[ ]	Wilderness Values	2-10-97
6.		[X]	[ ]	Visual Resource Management	2-10-97
7.		[ ]	[X]	Water Resources	2/18/97
8.		[ ]	[X]	Air Quality	2/18/97
9.		[ ]	[X]	Paleontological Resources	Thom E Nelson 2/19/97
10.		[ ]	[X]	Prime or Unique Farmlands	2/21/97
11.		[ ]	[X]	Wild and Scenic Rivers	2-10-97
12.		[ ]	[X]	Nat. Amer. Rel. Concerns	Blaine Miller 2-10-97
13.		[ ]	[X]	Wastes, Hazardous/Solid	2-18-97

The above project has been analyzed for conformance with BLM plans and consistency with local government plans. Significant discrepancies are discussed in the body of the environmental assessment.

BLM Plan and
Date: San Rafael RMP approved 5-24-91

Local Government Plans and
Dates: Zoning Resolution of Emery County, January 1984

The following items have also been considered in this Environmental Assessment. Items which may be impacted have been discussed within the Environmental Assessment; the remainder will not be affected and are not discussed.

	May Be Impacted	Will Not Be Affected	Resource	Specialist Signature/Date
1.	[r]	[ ]	Grazing	2/20/97
2.	[ ]	[X]	Wildlife	2/19/97
3.	[X]	[ ]	Recreation	2-10-97
4.	[o]	[ ]	Soils	2/21/97
5.	[X]	[ ]	HR 1500	2-10-97

M/015/072

6/6

Appendix C

Monitoring Plan

Introduction

This monitoring plan was prepared pursuant to the Bureau of Land Management's National Environmental Policy Act Handbook (H-1790-1), Chapter VI Monitoring. Under the Proposed Action, Bureau of Land Management and Western Clay Company would commit to setting up a monitoring program to ensure compliance with the decision record to measure the effectiveness of Bureau of Land Management's decisions. Specific goals of monitoring would be to:

1. Determine if mining-related activities and mitigation measures are being carried out in accordance with the decision record.
2. Evaluate what, if anything, is preventing or impeding accomplishment according to the decision record.
3. Assessment if actions and decisions are achieving intended environmental objectives.
4. Determine if the environmental impact predictions were accurate.
5. Assessment if the terms, conditions, and mitigation measures are still needed to achieve environmental objectives.

This monitoring plan would be carried out for the Proposed Action unless the information collected shows that monitoring of certain resources is unnecessary, whereon Bureau of Land Management may decide to eliminate portions of the monitoring plan. This plan would not be carried out under the No Action Alternative.

Reporting

Annual monitoring would be conducted on a January 1-December 31 calendar year. Each January throughout the life-of-project, Western Clay Company would develop an inventory and description of all existing project features, such as disturbance acreage and location, production, travel volumes and projected values for the next 12 months. Environmental surveys would be conducted during appropriate periods during the year and included in the annual report. Monitoring results would be compiled in reports and submitted by Western Clay Company to Bureau of Land Management annually on or before March 1. For each resource discussed in the existing environment, annual reports would address:

1. Environmental protection goals.
2. Mitigation measures carried out during the past year.
3. Periodic inventories for each affected resource, noting any trends across 2 years.
4, Degree to which environmental protection goals are being achieved.
5. Compliance with stipulations promulgated in the decision record.
6. Effectiveness of stipulations/mitigation measures in achieving environmental protection goals and any proposed modifications to this plan.

Bureau of Land Management may elect to meet with Western Clay Company to discuss and

modify, as necessary, monitoring protocols or mitigation measures for the subsequent year. Bureau of Land Management may request that other agencies such as U.S. Fish and Wildlife Service, participate in the monitoring evaluation.

Western Clay Company would be responsible for timely remediation of noncompliance situations. Bureau of Land Management would be notified in writing within five (5) working days of the discovery of the problem and consulted to determine an appropriate course of action. Remediation measures would be carried out in a timely manner to minimize environmental harm.

Annual Inventory and Monitoring

The purpose of this section is to identify the resources to be monitored, define resource-specific environmental protection goals, and recommend monitoring methods and schedules (or identify appropriate sources from which methods would be developed). The following resources would be or potentially impacted by the Proposed Action and thus, would be monitored as described below.

1. Stream channels
2. Soils
3. Vegetation
4. Microbiotic crusts
5. Threatened, endangered, and species of special concern such as the Wright fishhook cactus
6. Wild horses
7. Wilderness Study Area
8. Livestock grazing
9. Safety (i.e., road dust)
10. Visual resources
11. Noise
12. Recreation Use

The following resources would be negligibly impacted by the Proposed Action; therefore, monitoring of these resources would not be necessary.

1. Mineral, oil, and gas resources
2. Geologic hazards
3. Paleontological resources
4. Surface water, except stream channels
5. Groundwater
6. Wildlife, except wild horses
7. Cultural Resources
8. Hazardous materials

Project impacts on recreation cannot be reasonably assessed because there are insufficient baseline data concerning the number of recreational users and the frequency of visits to the area. Accidents between mine-related and recreation traffic would be reported via appropriate county offices and would be summarized in annual monitoring reports.

Physical Resources

Western Clay Company would be responsible for ensuring that:

1. Speed limits are being observed.
2. Surface disturbance is minimized.
3. Disturbed areas are being revegetated in a timely manner.
4. Vehicles remain on roads developed for quarry operations.
5. Loaded haul trucks are properly covered.
6. Dust suppression measures are carried out during drilling, blasting and stockpiling.
7. Only necessary areas are blasted at any given time.
8. Dust control measures are used on all stockpiles.
9. Dust control measures are used on all roads to ensure road safety.

Western Clay Company would also be responsible for ensuring that all combustion engines are maintained in good working order to minimize hydrocarbon and other gaseous emissions.

All stream channels where a culvert or low water crossing would be installed where the mine intersects drainages, would be visually inspected by Western Clay each spring within two (2) weeks after snow melt and within two (2) days after large (10 year-24 hour) storms to evaluate stream channel and bank stability near the access road and mine facilities. The integrity of erosions control devices such as riprap and rock aprons, would be maintained by Western Clay Company so that they are functioning to minimize accelerated erosion and gully formation. During on-site surveys, channels and channel banks would be inspected for signs of erosion such as incipient gully formation, new sediment deposits, and damage to or undercutting of erosion control devices. If any of these are observed, immediate remedial action would be taken, including, but not limited to, repairing or replacing erosion control devices, filling gullies, stabilizing surfaces with riprap, erosion control blankets or other appropriate measures. The overall goal would be to ensure that no crossings result in excessive downstream channel or stream degradation.

If effects of mining on stream channels cannot be evaluated via visual inspections, more rigorous monitoring methods, such as the installation and sampling of staked transects, may be required. This type of monitoring includes planting stakes across channels, leaving a segment of known height exposed above the ground surface and periodically measuring the amount of stake exposed. Unaffected channels may also be staked to provide an estimate of natural within-channel erosion rates.

Soil monitoring would be conducted to ensure that excessive erosion, such as readily apparent erosion above and beyond natural erosion rates, which can be attributed to mining activities is not occurring and that topsoil stockpiles are protected form erosion. Topsoil stockpiles would be inspected for the presence of rills and other indications of soil movement resulting in soil deposits at the base of stockpiles. Areas within and adjacent to disturbance areas would be visually inspected and appropriate remediation measures such as recontouring, stabilization with riprap, or other surface protection techniques, would be carried out immediately on any areas exhibiting excessive erosion. Monitoring also would verify that erosion control measures have been carried out on any steep slopes disturbed by mine

development and operations until vegetation becomes established.

The quarry site would also be visually inspected to ensure that:

1. Disturbance has been limited to areas required for mine development and operation.
2. Steep slopes have been avoided where possible.
3. Erosion control devices have been installed, where necessary and maintained such that water flows are diverted and/or slowed to reduce soil loss.

Monitoring would be completed annually in the spring after snow melt, when soils are dry, between March 1 and April 30.

Noise monitoring would be completed twice yearly, in early May and Late September, for two (2) consecutive days during mine operating hours. Monitoring stations would be established in the vicinity of the quarry at the edge of the Muddy Creek Wilderness Study Area. Noise levels would be measured using a hand-held device capable of measuring average and peak noise levels in dBA. Monitoring personnel would visit each site once each day and record ambient noise levels for a period of about three (3) minutes. Survey times would be alternated such that each site is visited once in the morning and once in the afternoon during each two-day survey.

Biological Resources

Vegetation reestablishment would be monitored pursuant to Utah Division of Oil, Gas, and Mining regulations, which require vegetation inventory in reclaimed areas before bond release. Revegetation would be considered to be complete when:

1. Vegetative cover is greater than or equal to 75 percent of pre-mining cover for three growing seasons following the last seeding, fertilization, or irrigation. If pre-mining cover is not known, ground cover in an adjacent undisturbed area that is representative of pre-mining ground cover would be used as the standard.
2. U.S. Fish and Wildlife Service and Utah Division of Oil, Gas, and Mining determine that revegetation has been satisfactorily completed within practical limits.

Western Clay Company would document the history of each reclaimed area, including reclamation dates, seedbed preparation methods, seed mixtures used, types and amounts of fertilization or other soil amendments, if any, postseeding maintenance practices, and a qualitative assessment of reclamation success. Quantitative sampling would be completed annually during years immediately before bond release, until Division of Oil, Gas, and Mining standards have been achieved. Cover, species composition, and species diversity would be evaluated using standard sampling protocols such as point-intercept transect or other appropriate methods. Reclamation history and results of quantitative sampling would be included in annual reports to Bureau of Land Management to ensure timely and successful reclamation of disturbed areas not required for ongoing mining operations. Species composition of the reclaimed areas would reflect the pre-mining vegetative community in both species and structure. Seed for the reclamation would be gathered from southwestern Emery County and used for seeding the reclaimed areas.

Disturbed areas would be monitored for weeds annually in late spring. If any weed species are discovered in or next to disturbance areas, Western Clay company would carry out mechanical weed control measures described in the plan of operations.

Western Clay Company would document the selective salvage and stockpiling of microbiotic crusts, including dates and amounts salvaged, duration of stockpiling, and dates and amounts used during reclamation. Any direct backhaul of crusts during reclamation would also be documented. Crust reestablishment on reclaimed areas would be assessed qualitatively during vegetation surveys and discussed in annual reports. Quantitative measurement of crust establishment would be conducted at 5-year intervals in all reclaimed areas developed based on the best available information from current sources.

Western Clay Company would be responsible for surveys for the federally endangered Wright fishhook cactus in each new area proposed for disturbance in the spring before disturbance. The purpose of monitoring would be to provide data on cactus populations and to determine the number of cacti affected by the Proposed Action. If any new individuals are found in the proposed disturbance areas, Western Clay Company would notify the Authorized Officer and carry out the measures included in the plan of operations and the mitigation measures described in the Environmental Assessment. Because the project is not likely to affect any other threatened or endangered, or special status species, no other monitoring would be necessary.

Western Clay Company would be responsible for monitoring the success of transplanting the Wright fishhook cactus and the germination of the cactus from seed. Western Clay Company would be responsible for hiring a qualified botanist, approved by the U.S. Fish and Wildlife Service, who would oversee the revegetation and Wright fishhook cactus recovery efforts. Western Clay Company would salvage and transplant the Wright fishhook cactus and would collect seed and cactus from the areas to be mined.

When observations of wild horses are made by Western Clay Company personnel, observations would be documented. Whenever possible, observations would include location, number of individuals, behavior such as grazing or fleeing, and age group, such as adult or juvenile. Observation data would be kept in a notebook onsite and summarized in annual reports to the Bureau of Land Management.

Western Clay Company personnel would observe the movements of livestock, which would be documented. Whenever possible, observations would include location, number of individuals, and behavior. The observation would be kept in a notebook onsite and summarized in annual reports to the Bureau of Land Management.

Wilderness Study Areas

Western Clay Company would be responsible for ensuring that mine-related activities do not cause surface disturbance within the Muddy Creek Wilderness Study Area. Mine operators and contractors would be instructed to avoid the Wilderness Study Area and Western Clay Company personnel would visually inspect areas within the Wilderness Study Area and next to the mine to ensure that no mine-related traffic is inadvertently crossing into the Wilderness

Study Area. Inspections would occur annually in the fall.

Visual Resources

Western Clay Company would be responsible for ensuring the visual intrusions are reduced as discussed in the Environmental Assessment. Stockpiles would be inspected on a regular schedule to make sure that their height is kept low enough to reduce the visual impact.

Western Clay Company would be responsible for monitoring the width of the disturbance of the road right-of-way and the county road does not exceed beyond that which is approved and/or existing and thereby create additional visual intrusions.

Noise

Western Clay Company would be responsible for monitoring noise levels to ascertain what off site impacts are occurring in the HR1500 unit and the Muddy Creek WSA. The company will also ensure that proper safety equipment is available and being used. Western Clay Company would ensure that all local, state, and federal noise standards are met.

Recreational Use

Western Clay Company would be responsible for keeping a log of any recreational activity around the mine area. The log entries would contain the number of recreationists, the activity being done, its duration, and its location in relationship to the mine.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
LINCOLN PLAZA
145 EAST 1300 SOUTH, SUITE 404
SALT LAKE CITY, UTAH 84115

In Reply Refer To
(CO/KS/NE/UT:6-UT-97-F-008) April 9, 1997

Memorandum

To: Area Manager, Bureau of Land Management, Price, Utah

From: Utah Field Supervisor, Utah Field Office, U.S. Fish and Wildlife Service, Salt Lake City, Utah

Subject: Biological Opinion for the Western Clay Company Hebe Gypsum Quarry

In accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), and the Interagency Cooperation regulations (50 CFR 402), this transmits the Fish and Wildlife Service's (Service) final biological opinion for impacts to federally listed endangered species for Western Clay Company's Hebe Gypsum Quarry. This opinion is provided to you as the lead Federal Agency regarding section 7 consultation on the project covered under this consultation. Copies of this opinion should be provided to the applicant because the Service has incorporated conservation recommendations that should be included as conditions of any permits issued by the Bureau of Land Management (Bureau) for this project.

Reference is made to your memorandum requesting initiation of formal section 7 consultation for the subject project and attached Biological Assessment describing the proposed action and the affected environment. The Service concurs with your "may affect" determination for the endangered plant species *Sclerocactus wrightiae* (Wright fishhook cactus).

BIOLOGICAL OPINION

Based upon the best scientific and commercial information that is currently available, it is the Service's biological opinion that the proposed project as described below, is not likely to jeopardize the continued existence of the plant species *Sclerocactus wrightiae*. The Service provides additional conservation recommendations for the species which we request be included in the Bureau's project development environmental mitigation stipulations.

PROJECT DESCRIPTION

Western Clay Company proposes to expand an existing 4.9 acre gypsum quarry to 81.5 acres to develop known gypsum resources in the Hebe Mountain area. This quarry is approximately 8.5 miles south of Interstate Highway 70 and one mile west of Muddy Creek in Emery County, Utah.

1. Western Clay will harvest annually, at least 50 percent of all mature seed from *S. Wrightiae* plants on areas planed for future quarry operations within the project area. Western Clay will use this seed to augment site revegetation during the reclamation of closed quarry areas.

2. The Bureau will ensure that a qualified botanist, approved by the Service, supervises the revegetation of the project area. In addition, the Bureau will monitor the site for compliance with revegetation stipulations and success in re-establishing the native plant community.

3. The Bureau will ensure that the site revegetation will accurately reflect the current vegetative community in both species composition and structure.

4. In addition to *S. wrightiae*, Western Clay will use native species from sources in southwestern Emery County, Utah, in re-vegetating the project site.

5. The Bureau will ensure that no exotic species are used in site re-vegetation.

6. Western Clay will ensure that all vehicles associated with the quarry project will remain on existing roads and quarry site at all times.

7. The Bureau will sign all appropriate roads to advise motorists to remain on existing roads.

CONCLUSION

This concludes the Service's biological opinion on the impacts of the proposed projects. This opinion was based upon the information described herein. If new information becomes available, new species listed, or any other change which alters the operation of the projects from that which is described in your correspondence and which may affect any endangered or threatened species in a manner or to an extent not considered in this biological opinion (see 50 CFR 402.16), formal section 7 consultation should be reinitiated.

Thank you for your cooperation in the formulation of this biological opinion and your interest in conserving endangered species.

BIOLOGICAL ASSESSMENT FOR FEDERALLY LISTED PLANT AND ANIMAL SPECIES FOR WESTERN CLAY HEBE GYPSUM MINE

Prepared by: Wayne Ludington
San Rafael Wildlife Biologist
San Rafael Resource Area
Moab District Office
Bureau of Land Management

I. Introduction

The purpose of this biological assessment is to evaluate the potential impacts of developing the Western Clay Hebe Gypsum Mine to those plant and animal species and their habitats which are listed as Federally Threatened, Endangered, and Proposed.

The Endangered Species Act of 1973 (PL 93-205), as amended, requires Federal agencies to ensure that any activities they authorize, fund, or carry out, do not jeopardize the continued existence of any wildlife species Federally listed as Threatened or Endangered (Section 7). This biological evaluation is an analysis of which Threatened, Endangered, or Proposed species may occur in the project area and whether any impacts on those species are anticipated.

II. Proposed Action

Western Clay Company has submitted a Plan of Operation (POO) to expand a gypsum quarry to develop known gypsum resources in the Hebe Mountain area approximately 8.5 miles south of I-70 and 1 mile west of Muddy Creek (POO and map is attached).

The proposed operation would expand the 4.9-acre mine to 81.5 acres, making three pits, including the access road between pits. The proposed operation would be located in T. 24 S., R. 7 E., Section 13, S½S½SW¼, Section 23, N½, and Section 24, N½NW¼, SLM in Emery County, Utah. The existing mine is located in T. 24 S., R. 7 E., Section 23, NW¼, SLM.

The proposed quarry would begin at approximately 35,000 tons/year and could increase to an estimated 200,000 tons/year of gypsum over the life-of-project (LOP). Based on an estimated reserve of greater than 1.1 million tons, the LOP is anticipated to be 10 years. BLM would issue a 30-year right-of-way (ROW) grant which could be renewed indefinitely.

A portion of the mining will be done with a 650-type reclaimer as made by CMI Corporation of Oklahoma City. These machines make little dust. The majority of the mining will be completed by drilling and blasting the gypsum. Drill holes will be made in the gypsum bed approximately five to eight feet apart and to a depth that will minimize the disturbance. The blasting will be conducted with dynamite and prell. Prell will be used sparingly so as to avoid the excessive scattering of material.

Access to the quarry would be provided by I-70, an existing Emery County road within the I-70 scenic corridor, and a existing access road (ROW UTU-73237) connecting the county road to the quarry site. The pits would be connected by access roads proposed and authorized under the Plan of Operation. The existing road would be upgraded as necessary to accommodate increased traffic and rock transportation. Both the existing road and the new road would be built to BLM specifications (BLM 1982).

All Federal, state, and local laws and regulations, including but not limited to air quality, water quality and solid wastes, would be complied with during the course of the operation of the gypsum mine.

Further details can be found in the Environmental Assessment (EA) for the project. The EA will evaluate current resource and management information.

III. Species Potentially Impacted by The Project

Threatened and Endangered Plant and Animal Species Known or Suspected to Be Present

Wright Fishhook Cactus (Sclerocactus wrightiae) Endangered

IV. Species Occurrences and Habitat Needs

Wright Fishhook Cactus (Sclerocactus wrightiae)

Wright fishhook cactus was listed as Federally Endangered on October 11, 1979. It resembles S. whipplei, but has smaller flowers (2-3.5 cm long) and short spines. The plants generally are found in the salt desert shrub to the juniper community at 4,790-6,120 feet elevation on the Mancos Shale Formation. They commonly occur on Curtis Sandstone and the tununk member of the Mancos Shale formation. The cactus flowers from April through May depending on the individual populations.

Since being listed, numerous studies have located populations in the San Rafael Resource Area. Ron Kass's inventory located thirty-two occurrences of Sclerocactus wrightiae in thirty-two sections; these represented five populations. The identified populations were generally found on the south and west sides of the San Rafael Swell. Ron Kass estimated that the Sclerocactus wrightiae population is between 25,000 and 50,000 plants (Per. Com. 1/22/97).

The proposed mine expansion was inventoried by Environmental Industrial Services on August 27 and again on October 3, 1996. The first survey was conducted during a long, dry period in which the area had not received any rain for several months. The survey found 25 plants distributed on the edges of the proposed mine area. A field inspection by Wallace Curtis of Western Clay Co. and two Bureau employees after some moisture in late September located several additional cactus in the mine area.

Fourteen individuals from Environmental Industrial Services, Western Clay Co, and the Bureau resurveyed the area on October 3, 1996. This survey located over 1000 *Sclerocactus wrightiae* plants. Most of the plants were located in sand pockets on the gypsum formation; however, some were located on the gypsum formation.

This survey was conducted after the area had received moisture from several storms. A large number of young cactus were located that would not have been observed without the moisture. It is suspected that the Sclerocactus wrightiae loses turgor pressure during the dry period. Loss of turger pressure would cause the smaller cactus to shrink under ground. The larger cactus would shrink pulling the thorns closer together and camouflaging the cactus.

The area within the mine plan contains over 1000 plants. Efforts to find alternate areas found the cactus population to be present over a large area. Additional surveys would be needed to determine the full extent of the population; however, five areas were sampled to help determine the distribution and density of the cactus in the surrounding area (see map). The table below shows the number of cactus found and the estimated density of cactus per acre.

SURVEY AREA	PLOT SIZE FOUND	# CACTUS PER ACRE	CACTUS DENSITY
1	100X440 (1.01 Ac)	29	29
2	100X100 (0.23 Ac)	18	78
3	100X100 (0.23 Ac)	46	200
5	100X100 (0.23 Ac)	5	22
6	100X100 (0.23 Ac)	37	161
Mine Area	80 acres	1000	13

V. Determination of Effects

Wright Fishhook Cactus (Sclerocactus wrightiae)

This action has the potential to remove over 1000 Sclerocactus wrightiae. The mine would be done in sections so that the total 81.5 acres would not be impacted at any one time. They propose to remove and store the soil from a 1-meter-radius circle around each cactus to 5 cm in depth. This soil would be replaced over the top of the reclaimed mine and, hopefully, would provide a seed for the reestablishment of the cactus. In addition, because they will be developing the mine in stages, they would dig up the cactus on each new area and replant them on the reclaimed portion of the mine. Western Clay Co. would try for a 30 percent survival rate for the transplanted cactus.

The access road was surveyed previously and the road routed to avoid the S. wrightiae plants found.

VI. Listed Species Biological Assessment Summary of Conclusions of Effects

Species	No Effect	May Affect - Not Likely to Adversely Affect	Likely to Adversely Affect	Beneficial Effect
Wright Fishhook Cactus			X	

Wright Fishhook Cactus (Sclerocactus wrightiae)

The proposed action would remove approximately 1000 Sclerocactus wrightiae. The operator would save soil from a 1-meter-radius circle 5 cm in depth for a seed base and transplant approximately 500 to 750 plants back on the disturbed area. With the expected 30 percent survival rate, 150 to 225 cactus would be expected to survive. The loss of 850 to 775 plants would not contribute to lost viability of the Sclerocactus wrightiae for the following reasons:

1) The surrounded area contains a significant population of S. wrightiae. The preliminary surveys indicated that several of these areas had a higher density of the cactus. The extent of the area and the overall cactus density are not known at this time. However, the cactus population appears to be present over an area of several thousand acres.

2) The operators would make an effort to relocate all the cactus possible. The transplant effort would be done in the fall and the cactus would be handled according to recommended methods provided by U.S. Fish and Wildlife Service.

3) The Resource Area contains a minimum of five populations of the cactus. This action would affect a portion of one population. Ron Kass estimates the present S. wrightiae population to be between 25,000 and 50,000 plants (Per. Com 1/21/97).

VII. Cumulative Effects

The operators would remove or transplant approximately 1000 individual plants of S. wrightiae. Approximately 250 to 500 plants would be lost during the start-up of the mine. As each phase of the mine was completed and the mine moved into new area, the cactus would be transplanted onto the reclaimed portion of the mine. The operators would transplant 750 to 500 individual cactus. With an estimated 30 percent success rate, the operators would be able to save 150 to 250 plants. This would result in the overall loss of approximately 750 to 850 plants. The operators would also save the soil around each plant as a potential seed bank. This soil would be spread on the top of the reclaimed portions of the mine. This is the only listed species that would be affected.

VIII. Mitigation

Western Clay Co. proposes to mitigate the impacts on the S. wrightiae by saving and spreading the soil from around each cactus plant on the reclaimed portions. They propose to remove and store the soil from a 1-meter-radius circle around each cactus to 5 cm in depth. This soil would be replaced over the top of the reclaimed mine and, hopefully, would provide a seed for the reestablishment of the cactus.

In addition, because the mine will be developed in stages, they would dig up the cactus on each new area and replant them on the reclaimed portion of the mine. Western Clay Co. would try for a 30 percent survival rate for the transplanted cactus. This survival rate would be from the removal of the cactus in the fall and replanting in the fall when the cool weather reduced the plants need for moisture and the potential of rain is improved.

IX. Documentation

Kass, Ronald. 1990. Final Report of Habitat Inventory of Threatened, Endangered and Candidate Plant Species in the San Rafael Swell, Utah. Prepared for the Bureau of Land Management. 87pp.

U.S. Fish and Wildlife Service. 1985. Wright Fishhook Cactus (Sclerocactus wrightiae) Recovery Plan. U.S. Fish and Wildlife Service, Denver, Colorado.

Resource Area files. USDI, Bureau of Land Management, San Rafael Resource Area. Price, Utah.

Utah Interagency Task Force. 1991. Utah Endangered, Threatened, and Sensitive Plant Field Guide.

WESTERN CLAY COMPANY

INDUSTRIAL/AGRICULTURAL MINERALS

Mr. Richard Manus, Area Manager
Bureau of Land Management
125 S 600 W
Price, UT 84501

May 23, 1997

Dear Mr. Manus:

I have seen copies of letters written by Mr. William B. Wray of Park City Utah and Mr. John Welch of Salt Lake City Utah commenting on environmental assessment UT-066-97-7 US GYPSUM SAN RAFAEL QUARRY. Both men commented that any new gypsum quarry should be located north of I-70 instead of south where U.S. Gypsum and Western Clay would like to operate quarries.

Before commenting on why Western Clay chose to lease claims south of the freeway I would like to mention possible motives for the above mentioned letters. Mr. Wray wants to receive royalty payments, his gypsum is mostly north of I-70. Mr. Welch is presently receiving royalty payments from Diamond K Gypsum and would like for Diamond K to have no competition.

Western Clay spent considerable time and effort evaluating the proper location of our gypsum quarry. We elected to mine at our present location south of I-70 for the following reasons:

1. Access to Mr. Wray's state leases would be difficult.
(A) The grades are too steep for empty or loaded haul trucks.
(B) The road to his leases crosses mining claims of John Welsh. I'm sure this would create a problem.
(C) Part of the road leading to Mr. Wray's leases and a good part of the leases are visible from the freeway.

2. The purity and brightness of the gypsum on the claims we lease south of the freeway is superior to gypsum we saw north of the freeway. This is born out by the fact that Western Clay has sold Georgia Pacific approximately 30,000 tons of high purity white gypsum for their white plaster market in the past nine months. G.P. was mining gypsum north of the freeway the entire time.

3. The lower bed of gypsum which is less folded and therefore more economical to mine is more extensive on our proposed site south of I-70.

In summation we opted to lease claims south of the freeway rather than north because the gypsum was of a higher quality, mining conditions were more economical, the mine and road would be less visible from the freeway, and the access road would not interfere with other operations.

Sincerely,

Neal J. Mortensen
Secretary Treasurer

P.O. Box 127, Aurora, Utah 84620 • OFFICE: (801) 529-3281 • PLANT: (801) 529-3445

Georgia-Pacific Corporation
P O Box 30006
North Las Vegas, Nevada 89036-0006
Telephone (702) 643-8100

May 27, 1997

Mr. Richard Manus
Bureau of Land Management, Moab District
125 South 600 West
Price, Utah 84501

RE: Western Clay Co.
San Rafael Quarry Plan Amendment
EA Log No. UT-066-97-08

Dear Mr. Manus:

2.1 The purpose of this letter is to express G-P Gypsum Corporation's (G-P) support for the Western Clay Company proposal to increase its mining activity in the San Rafael Swell area. G-P depends on the high quality gypsum available through the Western Clay mining operation. The Western Clay operation provides high-quality, white gypsum rock to G-P's gypsum products plant located in Sigurd, Utah. The white gypsum rock is the primary raw material for the G-P Sigurd plant's industrial plaster product line. Because of its proximity to G-P's Sigurd plant, the mine is able to provide this important raw material to G-P at a reasonable cost. G-P would like to pursue a long-term contract to secure this supply of white gypsum rock for our Sigurd operation; however, such a contract is currently unlikely due to the nature of the restrictions on Western Clay Company's mining. If G-P has to seek other sources of white gypsum rock, this could have a significant impact on the G-P Sigurd plant.

Please feel free to contact me at 702-643-8100.

Sincerely,

Bob Shajary

cc: J. W. Carter, Utah Division of Oil Gas & Mining
N. Mortensen, Western Clay Company

Southern Utah Wilderness Alliance

28 May 1997

Penelope Dunn, Assistant Area Manager
BLM - Price Resource Area
125 S. 600 W.
P.O. Box 7004
Price, Utah 84501

Dear Penny,

Here are our comments on the Lone Tree Wedge gypsum mine and plan of operations. In general, we are puzzled that the BLM thinks that a project of this size can get away with such a meager EA. We hope that the BLM's decision to exert so little effort on the environmental analysis is a sign that you expect to select the no action alternative or prepare a full EIS for the project.

Issues treated inadequately or not at all. Many serious issues are either totally absent from the EA, or are merely mentioned without being analyzed. Among them are:

3.1 • Air quality and dust emissions. The EA should analyze, in a quantitative manner, the effects of the project on air quality and visibility. Cumulative effects should be analyzed, quantitatively.

3.2 • Noise. Noise impacts in the nearby Muddy Creek WSA, and also in HR 1500 areas, should be analyzed quantitatively. This should include the mining operations and also truck traffic along those parts of the access roads which go near HR1500 areas.

3.3 • Sensitive soils. The EA mentions that the project area has sensitive soils, but makes no effort to analyze the effect the project would have on the soils (e.g. wind erosion, water erosion, salt production). Nor is it clear from the EA that reclamation is feasible or likely. For example, no water is allocated for seed germination.

3.4 • Traffic. The EA needs to consider, quantitatively, the likelihood of traffic-related toxic spills, human mortality, and wildlife mortality along the entire route from the mine to the plant location. Cumulative impacts from truck traffic associated with the U.S. Gypsum mine should also be analyzed.

3.5 **Impacts on Wilderness Study Areas and H.R. 1500 Lands.** SUWA is very concerned about the location of this project on H.R. 1500 lands. We believe that the No Action alternative or another reasonable alternative should be pursued in order to keep this H.R. 1500 unit, as well as other adjoining units, from being further degraded by development. Ample gypsum reserves exist outside of the H.R. 1500 proposal, and we encourage U.S. Gypsum to consider moving its operation to one of these areas. In addition, the BLM must detail how the "nonimpairment standard" for the Muddy Creek WSA is met.

3.6 **Paleontological Resources.** The stipulations state that mine employees will be responsible for detecting paleontological resources in the project area. Will mine employees be trained to recognize such resources? Since no predisturbance survey was done, assessment of the fossil resources in this area would depend solely on the chance identification of fossils by people without a background in the field. This is insufficient to protect the paleontological resources

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in the area.

Cultural and Historical Resources. The BLM must comply with NAGPRA, AIRFA, and the National Historic Preservation Act (NHPA) with respect to prehistoric and historic sites. Under the NHPA, the State Historic Preservation Officer and potentially affected Native American groups and individuals must be consulted about historic and cultural resources that may be affected by the project. The BLM's failure to consult and conduct proper NHPA review fatally flaws the EA and any FONSI that may be issued. The EA makes no mention of any survey of the area for cultural and historical resources.

3.7 The BLM's Manual requires direct and active consultation with Native groups and individuals before the environmental and other reviews are completed and before the project can be approved. General Procedural Guidance for Native American Consultation, H-8160-1. Despite the binding nature of the Manual on BLM's consultation duties, the Record is conspicuously lacking any mention of such activity.

In addition, the NHPA's Part 800 regulations require consultation with affected tribes on any federal "undertaking" such as a Plan of Operations approval. In Attakai v. United States, 746 F. Supp. 1395 (D. Ariz. 1990), the court enjoined the Bureau of Indian Affairs from proceeding with construction of range improvements because the agency had neglected to comply with NHPA procedures. Despite the fact that the BIA had undertaken archeological surveys and mitigated some impact to historic properties, the agency had not consulted with affected tribes. The court specifically rejected the BIA's substantial compliance defense, holding that the procedures violated the letter and spirit of the regulations. Id. at 1405-1409. See also McMillan Park Comm. v. NCPC, 759 F.Supp. 908 (D.D.C. 1991).

Lack of baseline data. Baseline data for the impacts being analyzed in the EA (air quality, noise levels, visibility, recreation, etc.) is sadly lacking. In the case of recreation, this is explicitly admitted (page 3 of the monitoring plan). This lack of baseline data violates NEPA's mandate that baseline data be gathered before the EA/EIS process is completed. CEQ regulations place specific requirements on federal agencies when a NEPA document is based on incomplete or unavailable information:

> When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment or an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

3.8

> (a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall cost of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.
>
> (b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall cost of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impacts statement:
>
> (1) A statement that such information is incomplete or unavailable; (2) a statement of the foreseeable significant adverse impacts on the human environment; (3) a summary

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> of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. . .

40 C.F.R. § 1502.22 (emphasis added).

This provision requires the "disclosure and analysis of the costs of uncertainty [and] the costs of proceeding without more and better information." Southern Oregon Citizens Against Toxic Sprays, Inc. v. Clark (SOCATS), 720 F.2d 1475, 1478 (9th Cir. 1983). "On their face these regulations require an ordered process by an agency when it is proceeding in the face of uncertainty." Save Our Ecosystems v. Clark, 747 F.2d 1240, 1244 (9th Cir. 1984).

Thus, 40 C.F.R. § 1502.22 imposes three mandatory obligations on the BLM in the face of scientific uncertainty: (1) a duty to disclose the scientific uncertainty; (2) a duty to complete independent research and gather information if no adequate information exists (unless the costs are exorbitant or the means of obtaining the information are not known); and (3) a duty to evaluate the potential, reasonably foreseeable impacts in the absence of relevant information, using a four-step process. The BLM has failed to meet the requirements of 40 C.F.R. § 1502.22 in the face of scientific uncertainty regarding many of the foreseeable environmental impacts of the Project.

The Ninth Circuit determined that "Section 1502.22 clearly contemplates original research if necessary" and held that "NEPA law requires research whenever the information is significant. As long as the information is . . . essential or significant, it must be provided when the costs are not exorbitant in light of the size of the project and the possible harm to the environment." Save Our Ecosystems, 747 F.2d at 1244 n.5. See also SOCATS, 720 F.2d at 1479 (§ 1502.22(a) requires the BLM to independently assess the safety of the herbicides it uses if existing data is inadequate). Although NEPA does not mandate substantive results, its action-forcing procedural provisions "are not highly flexible, [and] establish a strict standard of compliance." Calvert Cliffs Coordinating Comm. v. United States Atomic Energy Comm'n, 449 F.2d 1109, 1112 (D.C. Cir. 1971).

Lack of Alternatives. There should be a wider range of alternatives in the EA. In particular, mining at another location, and also mining in lesser amounts/acreage, should be presented as alternatives.

At a minimum, a full analysis of the reasons for rejecting reasonable alternatives such as other sites should have been included. "The agency must explicate fully its course of inquiry, its analysis and its reasoning." Dubois v. U.S. Department of Agriculture, 102 F.3d 1273, 1287 (1st Cir. 1996). An agency decision must always have a rational basis that is both stated in the written decision and demonstrated in the administrative record accompanying the decision. Kanawha & Hocking Coal & Coke Co., 112 IBLA 365, 368 (1990). The decision must be made in a "careful and systematic manner." Edward L. Johnson, 93 IBLA 391, 399 (1986). The record must demonstrate a "reasoned analysis of the factors involved, made in due regard for the public interest." Alvin R. Platz, 114 IBLA 8, 15-16 (1990). Where, as here, BLM has made no analysis of the "cost" factors involved or the public interest because it predetermined that such costs were unacceptable, then BLM's decision is unreasonable.

The Supreme Court has made crystal clear the obligation of an agency to document its analysis in the record when making a decision otherwise left to the agency's discretion. In Burlington Truck Lines v. United States, it held:

> There are no findings and no analysis here to justify the choice made, no indication of the basis on which the [agency] exercised its expert discretion. We are not prepared to and the Administrative Procedure Act will not permit us to accept such ... practice. ... Expert discretion is the lifeblood of the administrative process, but "unless we make the requirements for administrative action strict and demanding, expertise, the strength of modern government, can become a monster which rules with no practical limits on its discretion."

371 U.S. 156, 167 (1962) (internal citations omitted).

Hence, an agency's explanation of the basis for its decision must be documented in and supported by an administrative record, which includes a "rational connection between facts found and the choice made." Bowen v. American Hospital Ass'n, 476 U.S. 610, 626 (1986).

The IBLA has correctly applied this principle to appeals within the Department of the Interior, finding that:

3.9

> It is incumbent upon BLM to ensure that its decision is supported by a rational basis and that such basis is stated in the written decision, as well as being demonstrated in the administrative record accompanying the decision.

Kanawha & Hocking Coal & Coke Co., 112 IBLA 365, 368 (1990) (emphasis added), citing Eddleman Community Property Trust, 106 IBLA 376, 377 (1989); Roger K. Ogden, 77 IBLA 4, 7 (1983).

The failure to adequately consider all reasonable alternatives violates NEPA. The BLM must take "a hard look at the alternatives and explains its reasons for rejecting them." Coalition on Sensible Transp., Inc. v. Dole, 642 F.Supp. 573, 593 (D.D.C. 1986), aff'd, 826 F.2d 60 (D.C. Cir. 1987). The Council on Environmental Quality's NEPA regulations, applicable to all federal agencies, states that:

> Agencies shall: Study, develop, and describe alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources. This requirement of section 102(2)(E) [of NEPA] extends to all such proposals, not just the more limited scope of section 102(2)(C)(iii) where the discussion of alternatives is confined to impact statements.

40 CFR 1507.2(d).

Even if the level of alternatives analysis is less under an EA than an EIS, courts have routinely held that such a "lower" standard of analysis only dismisses consideration of "remote, speculative, impractical or ineffective" alternatives. All Indian Pueblo Council v. U.S., 975 F.2d 1437, 1444 (10th Cir. 1992), quoting City of Aurora v. Hunt, 749 F.2d 1457, 1467 (10th Cir. 1984). The Ninth Circuit has succinctly laid out NEPA's requirements for EAs:

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Moreover, consideration of alternatives is critical to the goals of NEPA even where a proposed action does not trigger the EIS process. This is reflected in the structure of the statute: while an EIS must also include alternatives to the proposed action, 42 U.S.C. 4332(2)(C)(iii), the consideration of alternatives requirement is contained in a separate subsection of the statute and therefore constitutes an independent requirement. See id. 4332(2)(E). The language and effect of the two subsections also indicate that the consideration of alternatives is of wider scope than the EIS requirement. The former applies whenever an action involves conflicts, while the latter does not come into play unless the action will have significant environmental effects. An EIS is required where there has been an irretrievable commitment of resources; but unresolved conflicts as to the proper use of available resources may exist well before that point. Thus the consideration of alternatives requirement is both independent of, and broader than, the EIS requirement. In short, any proposed federal action involving unresolved conflicts as to the proper use of resources triggers NEPA's consideration of alternatives requirement, whether or not an EIS is also required.

Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228-1229 (9th Cir. 1988), cert. denied, 489 U.S. 1066 (1989).

Other courts have affirmed the alternatives requirement under NEPA for EAs. "This requirement is independent of the question of environmental impact statements, and operative even if the agency finds no impact.... For nonsignificant impact does not equal no impact, so if an even less harmful alternative is feasible, it ought to be considered." River Road Alliance, Inc. v. Corps of Engineers, 764 F.2d 445, 452 (7th Cir. 1985)(emphasis added). Thus, in this case the BLM's obligation to review all reasonable alternatives is clear.

A federal land agency cannot reject an alternative on the grounds that the mining project proponent may incur added costs if that alternative is required. Clouser v. Espy, 42 F.3d 1522 (9th Cir. 1994)(upholding environmental protections that adversely affect the economic validity of the mining claims). In addition, the BLM cannot reject the no-action alternative required by NEPA simply because the applicant has filed mining claims. Without an analysis of all costs, including environmental compliance costs, the applicant cannot verify that its claims are indeed valid. NEPA requires a hard look at this alternative and without any knowledge as to the total economics of the project, any assumption as to the validity of the mining claims is arbitrary.

Omissions in Assessment of Reasonably Foreseeable Development and Cumulative Impacts. The EA mentions that there will be cumulative impacts from nearby mining projects, but it fails to analyze these impacts (beyond merely adding up the number of acres which will be disturbed). Impacts on visibility, Wright Fishhook Cacti, noise, soils, recreation, traffic, etc., should be analyzed. Perhaps this lack of analysis is to be expected, since the EA fails to analyze most of the direct impacts from the project. Expected or not, this failure to analyze cumulative impacts is unacceptable and illegal.

NEPA requires that agencies undertake a cumulative impacts analysis when determining whether an EIS is required. Sierra Club v. U.S. Forest Service, 843 F.2d 1190 (9th Cir. 1988); Thomas v. Peterson, 753 F.2d 754 (9th Cir. 1985). NEPA regulations define "cumulative impact" as:

The impact on the environment which results from the incremental impact of the action

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when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 CFR 1508.7. The BLM utterly failed this duty in preparing the EA in this case.

The lack of a cumulative impacts analysis has been found to invalidate a FONSI. In Alpine Lakes Protection Society v. U.S. Forest Service, 838 F. Supp. 478, 484 (W.D. Wash. 1993), the Court stated:

3.10

> The NEPA process is intended to help public officials make decisions that are based on an understanding of environmental consequences, and to take actions that protect, restore, and enhance the environment. 40 CFR 1500.1(c). See also 42 U.S.C. 4332(2)(E)(federal agencies shall study, develop, and describe appropriate alternatives to recommended course of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources). The failure to even consider whether there is a potential for cumulative impact on any aspect of the environment ... as a result of these projects cannot be characterized as a "truly informed exercise of discretion", nor can it be said to amount to the requisite `hard look' at the environmental consequences of granting the permits in question. See Marsh v. Oregon Natural Resources Council, 490 U.S. 360, 377 (1989). It is this failure to even consider whether there is a potential for any cumulative impact as a result of the connected and cumulative actions that makes the [agency] decision arbitrary and capricious. See Seattle Audubon Society v. Mosely, 798 F. Supp. 1473, 1483 (W.D. Wash. 1992)(the failure to consider a relevant factor is in itself arbitrary and capricious).

In this case, the failure to review the cumulative impacts from the other mining proposal(s) (mining exploration, development, operation, etc.) in the area on recreation, visual impacts, aesthetics, air quality, historical values, roadless values, and other resources precludes the issuance of a FONSI and fatally flaws the EA.

3.11

Validity of mining claims. Has this proposal passed the Coleman test of a valuable mineral deposit? Given the distance of this deposit from the processing plant, it is certainly possible that the costs of extraction, production, processing and marketing this gypsum may exceed the profits, especially when the costs of mitigation are included. Unless the deposits can be extracted and sold at a profit, the claims are invalid. This issue was raised in the San Rafael Proposed Resource Management Plan (A-182) with respect to gypsum mining throughout the San Rafael Swell: "When compared with more suitable gypsum deposits, this area may be too remotely situated with respect to market area to be economically attractive."

3.12

Reclamation plan. The EA doesn't contain an approved reclamation plan, thus depriving the public of the opportunity to comment on it -- in violation of NEPA. The failure to insure reclamation violates FLPMA and 43 CFR part 3809. At a minimum, the lack of any water resources committed to reclamation removes any credibility from the overly optimistic and unsupported plant reclamation scenario.

Wright Fishhook cactus. The "no jeopardy" opinion issued by the FWS appears to be without any rational, scientific basis. No information on the local and species-wide population

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dynamics and genetics is given. No information on whether the species as a whole is in decline is given. The 1000 cacti that would be uprooted by the mine comprise a rather large percentage (2-4%) of the total population of this plant. Considering the species' endangered status, this seems like an excessively large number. In a letter to the BLM dated May 28, 1997, Dr. Ronald J. Kass, a leading authority on the species, expresses the above concerns. He also notes that according to his own research, populations of Wright Fishhook Cacti are in decline. If a "no jeopardy" opinion is to be issued, it should be based on thorough science, not vague intuitions. The BLM cannot simply adopt such a flawed and unsupported conclusion.

3.13

Monitoring plan. Many of the above issues (noise impacts, for example) which are not treated adequately in the EA are also absent from the monitoring plan.

3.14

Mitigation. Little mention is given as to the exact nature and timing of the proposed mitigation. Failure to properly disclose and require mitigation to reduce impacts to the level of insignificance violates NEPA.

3.15

Conclusion In summary, SUWA supports the No Action alternative or the use of an alternate site outside of the HR 1500 citizen's wilderness proposal. At a minimum, the above-noted violations of federal law and regulation, as well as the BLM's own Manual, require correction before any project or projects can be authorized. The San Rafael Resource Management Plan does not include a site-specific analysis of the environmental impacts of gypsum mining.

3.16

Because of the number of existing projects and the increasing interest in gypsum mining in the San Rafael Swell, the effects of gypsum mining in the area should be addressed in an Environmental Impact Statement before any new projects are allowed to proceed.

3.17

Thank you for your attention to these concerns.

Please send to the undersigned copies of all future documents, public notices, etc., related to this project or to other gypsum mining activities in the area.

Kevin Walker
Southern Utah Wilderness Alliance
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(801) 259-5440

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DIVISION OF OIL, GAS AND MINING

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May 30, 1997

Neil Simmons
BLM Price River/San Rafael Resource Area
P.O. Box 7004
Price, Utah 84501

Re: EA No. UT-066-97-8, Western Clay Company, Lone Tree Wedge Gypsum Mine/Plan of Operations (aka Hebe Gypsum Mine M/015/072), Emery County, Utah

Dear Mr. Simmons:

Enclosed are the Division comments on the Lone Tree Wedge Gypsum Mine EA document. Our files currently refer to this proposed operation as the Hebe Gypsum Mine, file number M/015/072. Our comments are listed separately for convenience.

The Division is currently reviewing the Plan of Operations (Appendix A to the EA document) specifically to determine if it meets the requirements of our Minerals Rules. Our review should be completed in the immediate future and we will provide you with a copy of the letter we send to the operator. If you have any questions regarding these EA comments you can reach me by phone at (801) 538-5267.

Sincerely,

Anthony A. Gallegos
Senior Reclamation Specialist

jb
Enclosure: DOGM's EA Review Comments
M15-72ea.rvw

DOGM Comments on EA UT-066-97-8 Lone Tree Wedge Gypsum Mine/POO M/015/072

(May 30, 1997)

4.1 Stipulation 2 of the EA states that all disturbed areas shall be restored to the approximate original contour. This stipulation does not seem realistic for the areas of gypsum removal unless borrowed materials are brought in. Was this stipulation intended to require all disturbed areas to be regraded to blend in with the natural topography?

4.2 Stipulation 2 of the EA requires the seed to be used in reclamation to originate from native plant species occurring in southwestern Emery County. Does this stipulation mean that all seed to be used during reclamation of this site must have been collected from plants in the area, or was the intent of this stipulation to limit the seed species to only those native to southwestern Emery County?

4.3 Page four of the proposal describes the estimated acreage disturbed and reclaimed annually. The annual acreages treat the areas reclaimed annually as being fully released during the same year of reclamation. Under Division rules, reclaimed areas may not be fully released for up to three years after the areas have been seeded. This may not have an effect on the areas considered disturbed annual according to BLM rules.

4 The disturbed acreages described on pages four and five of the proposal do not match the acreages shown on drawing titled "Plan of Operations 1997-2008 Hebe Mining Claims" revision date 2-23-97. The acreages on the drawing are grouped according to phases rather than years, however, taking this into consideration does not resolve the differences. Also, the schedule described under this section of the proposal does not agree with the schedule received by Division staff while at the mine site on February 24, 1997.

M15-72ea.rvw

Letter of Comment Responses
for Western Clay Company

1.1-Thank you for your comment.

2.1-Thank you for your comment.

3.1-A quantitative analysis for air quality and dust emissions was completed and it was determined that with the dust control measures included in the plan of operations, air quality would not be impacted. A negative declaration can be found on page 2 of the environmental assessment. Since air quality would not be affected, it is not addressed in the cumulative impacts section. Western Clay Company would monitor and maintain air quality in accordance with the Utah air quality permit which would be issued for this project.

3.2-The section on noise impacts has been augmented. Due to the infrequent and dispersed nature of recreational use in the area, it is expected that impacts would be minor.

3.3-The portion of the impacts to the soils has been expanded.

3.4-The additional vehicular traffic would be negligible compared to existing traffic. A rate of 20-25 trucks per day would occur at a production level of 250,000 tons per year. The increase in human mortality and wildlife mortality would be negligible. Gypsum is not considered to be a toxic material. Therefore, the trucks do not carry toxic material and will not cause toxic spills. The traffic of U.S. Gypsum Company's proposal has been added to the cumulative analysis.

3.5-This environmental assessment analyzes the impacts of gypsum mining done by Western Clay Company, not United States Gypsum Company. No protection from mineral entry is afforded to HR1500 areas. These claims are leased by Western Clay Company. The Bureau of Land Management cannot require that other claims be mined, but can only respond to the proposals on the claims in question. No mining or other activities are proposed by Western Clay Company for any of the area encompassing the Muddy Creek Wilderness Study Area; therefore, this standard is not applicable. As stated in the environmental assessment, the Bureau of Land Management agrees that mine development and operation would temporarily prevent these HR-1500 lands from being designated as wilderness; however, with the completion of successful rehabilitation, the area could contain the elements required for wilderness consideration.

3.6-The probability of finding fossils in the area of the gypsum mine is very low. The stipulation for paleontological resources is standard and is used on the off-chance that something may be discovered during excavation. Archaeologists note the presence and report any sighting if they are present. A cultural inventory was completed for the area and no fossils were reported. Ordinary people have proved to be very adept at

finding fossils. The Bureau of Land Management believes the stipulation is sufficient to protect the paleontological resources in the area.

3.7-The Bureau of Land Management has complied with all cultural and historic preservation laws applicable to this project. Two intensive archaeological inventories have been conducted in the area of Western Clay Company's proposal as identified in the environmental assessment, in accordance with the Section 106 of the National Historic Preservation Act. No Historic properties were found in the proposal's area of effect. The Bureau of Land Management and Utah State Historic Preservation Office concurred with the results of these inventories. Contacts with Indian Tribes during resource scoping and planning in this area have not identified any cultural properties. Therefore, no additional Native American consultation is required and the project is in compliance with the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, and the National Historic Preservation Act.

3.8-Pursuant to 40 Code of Federal Regulations 1502.22, the Bureau of Land Management acknowledges that baseline data for some resources are insufficient to precisely estimate impacts. Complete environmental information is never available for any affected environment. The conventional practice in National Environmental Protection Act analysis is to use extant information unless critical issues compel the gathering of additional data. Determination of whether additional data should be collected for any Nation Environmental Protection Act analysis is governed by a "rule of reason" wherein federal officials balance the need, cost, utility, and applicability of data that could be obtained when deciding to collect additional data. Baseline data need only be sufficient to enable the Bureau of Land Management to make an informed decision in selecting one of the alternatives analyzed in the environmental assessment.

The Bureau of Land Management typically does not do intensive data gathering to quantify the volume of recreation taking place. Recreation is addressed in terms of the opportunity for recreation provided by an area or landscape. A proposed action is analyzed for impacts that cause changes in recreational opportunity. Recreation opportunities should not be appreciably changed. The text of the environmental assessment has been changed to make this clear.

3.9-Moving the operation to a location within the Hebe mining claim group would increase the impacts on all the resources as it would increase the amount of disturbance. Western Clay Company does not hold any other claims nor any leases of claims in the area; therefore, any analysis of other locations would be entirely speculative as no authorization for such mining activity has been obtained from the owners.

3.10-All existing operations are addressed in the cumulative impact sections.

3.11-The marketability test is used in patent application examinations and validity examinations of mining claims. This is beyond the scope of this environmental

assessment, which addresses the impacts of the proposed gypsum mine expansion on the environment. Even if contest proceedings were initiated, the mining claims would be considered to be valid until a final determination was made.

3.12-The plan of operations contains the reclamation plan which will be approved when the Decision Record is issued. The reclamation plan could be commented on during the public comment period for the environmental assessment. The Bureau of Land Management believes the proposed action contains enough information so the impacts can adequately be addressed. Reclamation will be difficult but possible. United States Gypsum has rehabilitated exploration areas in the vicinity of Kimball Draw and revegetation is proceeding satisfactory. Georgia-Pacific Corporation and the partnership of Welsh and Wray have successfully reclaimed both exploration and mined areas just north of Interstate 70. Based on available literature, the Bureau of Land Management believes that the methods included in the environmental assessment would promote successful reclamation.

3.13-The Bureau of Land Management is required by the Endangered Species Act to consult with the U.S. Fish and Wildlife Service whenever an action may impact a listed species. This was done through a Section 7 Consultation in which the Bureau requested a species list for U.S. Fish and Wildlife Service for any listed species that may be present in area of the proposed mine. This list was used to develop a Biological Assessment to evaluate the potential effects of the proposed action on listed and proposed species. It was then determined whether any such species or their habitat would likely be adversely affected by the proposed action. Using the Biological Assessment, the U.S. Fish and Wildlife Service developed a Biological Opinion which determined if the proposed action would jeopardize the continued existence of the species.

In this instance, the number of cactus found in the surrounding area, taken into consideration with both the number of cactus affected and the status of the cactus, the U.S. Fish and Wildlife Service determined that the proposed action would not jeopardize the continued existence of the Wright fishhook cactus. The Biological Assessment has been added to the Biological Opinion in Appendix D of the environmental assessment.

3.14-Noise and recreational use have been added to the monitoring plan.

3.15-The efficacy of the proposed mitigation measures has been added to the environmental assessment.

3.16-The Proposed San Rafael Resource Management Plan/Final EIS does not include site-specific analysis of gypsum mining because it is a programmatic document whose scope does not include action specific analyses. This environmental assessment is the appropriate document that analyzes the impacts of the proposed gypsum mining project on a site-specific basis.

3.17-The Bureau of Land Management believes the Proposed San Rafael Resource Management Plan/Final EIS adequately addresses the impacts of mining Law administration activities in the area, which includes the mining of gypsum.

4.1-Restoring an area to approximate original contour means that the topographic expression would be maintained, but it would be at a lower elevation. It does not mean exactly the same contour at the same elevation will be restored to that which existed before the mining took place.

4.2-Seed for the Wright fishhook cactus would be collected from plants in the immediate area, while the seeds for the other species would be collected in southwestern Emery County.

4.3-We assume that reclamation would not be considered to be successful and released until five years after a disturbed area is recontoured and reseeded. This statement can be found on page 4 of the environmental assessment in the Proposed Action. No reclaimed areas would be released without concurrence of the Utah Division of Oil, Gas, and Mining. The actual estimated disturbances can found on page 13 of the plan of operations.

4.4-Western Clay Company modified their proposed disturbances and these acreages agree with the drawings which show phases. The schedule and drawings correct and update the schedule found on page four of the plan of operations. The schedule found on page 13 of the plan of operations and its related drawings are the correct estimates for the proposed disturbance and reclamation. The disturbances do not include the access road right-of-way.

APPENDIX F

Plant Species List

Common Name	Scientific Name
Shrubs	
Dwarf Sagebrush	*Artemisia Nova*
Four-wing Saltbush	*Atriplex canescens*
Shadscale	*Atriplex confertifolia*
Mat saltbush	*Atriplex corrugata*
Rubber rabbitbrush	*Chrysothamnus nauseousus*
Ephedra torreyanna	*Torrey Mormon tea*
Buckwheat	*Eriogonum spp.*
Broom snakeweed	*Gutierrezia sarothrae*
Skunkbush	*Rhus trilobata*
Bushy princesplume	*Stanleya pinnata*
Tamarisk	*Tamarix pentandra*
Forbs	
Mustard	*Brassica spp.*
Golden cryptantha	*Cryptantha flava*
Desert Trumpet	*Eriogonum inflatum*
Halogeton	*Halogeton glomeratus*
Green Molly	*Kochia americana*
Small flowered globemallow	*Sphaeralcea parvifolia*
Winterfat	Eurotia lanata
Blazing star stickleaf	*Mentizilia pumila*
Russian thistle	*Salsola iberica*
Grasses	
Desert saltgrass	*Distichlis spicata*
Galleta grass	*Hilaria jamesii*

Indian ricegrass	*Oryzopsis hymenoides*
Succulents	
Prickly pear cactus	Opuntia spp.
Wright fishhook cactus	*Sclerocactus wrightiae*

APPENDIX G

Animal Species List

Common Name	Scientific Name
Mammals	
Little brown myotis	*Myotis lucifugus*
California myotis	*Myotis califonicus*
Desert cottontail	*Sylvilgus audubonii*
Whitetail jackrabbit	*Lepus townsendii*
Blacktail jackrabbit	*Lepus califonricus*
Golden-manteled ground squirrel	*Spermophilus lateralis*
White-tailed antelope squirrel	*Ammospermophilus leucurus*
Northern pocket gopher	*Thomomys tapoides*
Cliff chipmunk	*Eutamias dorsalis*
Ord's kangaroo rat	*Dipodomys ordii*
Deer mouse	*Peromyscus maniculatus*
Brush mouse	*Peromyscus boylei*
Pinyon mouse	*Peromyscus truei*
Northern grasshopper mouse	*Onychomys leucogaster*
Coyote	*Canis latrans*
Red fox	*Vulpes vulpes*
Gray fox	*Urocyon cinereoargenteus*
Badger	*Taxodea taxis*
Striped skunk	*Mephitis mephitis*
Mountain lion	*Felis concolor*
Desert bighorn sheep	*Ovis canadensis nelsoni*
Mule deer	*Odocoileus hemionus*
Pronghorn antelope	*Antilocapra americana*
Birds	

APPENDIX H

Summary of Potential Impacts and Mitigation for the Proposed Action

Resource	Potential Impacts		Mitigation
	Proposed Action	No Action	
Air Quality	Increased fugitive dust emission from quarry and along haul road	Dust emissions would continue at present levels	Suppress dust using watering or chemical chemical suppressants
	Increased emission from internal combustion engines	Pollutant emissions from engines would continue at present levels	Maintain equipment in proper working order
Mineral Resources	Depletion of gypsum resource	Depletion of gypsum resource at 25 percent of Proposed Action	None recommended
Topography	Reduction of topography by 20 feet on 25.75 acres	Reduction of topography by 12 feet on 20 acres	None recommended
Paleontological Resources	No impact anticipated	No impact anticipated	Suspend activities in vicinity of unanticipated discover
Geologic Hazards	No impact	No impact	None recommended
Soils	Disturbance of 25.75 acres of soils at any one time and resulting soil loss due to accelerated erosion	Disturbance of 12 acres of soils at any one time and resulting soil loss due to accelerated erosion	Minimize disturbance, prompt reclamation of disturbed areas no longer needed, use soil erosion control techniques devices, implement stormwater plan
	Loss of soil fertility and structure on 25.75 acres	Loss of soil fertility and structure on 12 acres	Minimize disturbance, prompt reclamation of disturbed areas no longer needed for operations
	Temporary soil compaction on 25.75 acres	Temporary soil compaction on 12 acres	Rip and disk all compacted areas prior to revegetation, restrict off-road traffic
	Soil contaminations due to accidental hazardous material spills	Soil contamination due to accidental hazardous material spills	Adhere to spill prevention, control, and countermeasures plan
Surface Water	Negligible increased sedimentation in streams due to accelerated erosion	Negligible increased sedimentation in streams due accelerated erosion	Minimize disturbance, prompt reclamation of disturbed areas no longer needed for operations, use of erosion control techniques devices, implement stormwater plan
	Potential channel alteration	Potential channel alteration	Use best management practices to maintain present surface runoff patters and prevent excessive channel or bank erosion; adhere to BLM road standards

	Surface water contamination due to accidental hazardous material spills	Surface water contamination due to accidental hazardous materials spills	Adhere to spill prevention, containment, and countermeasures plan
Groundwater	No impact	No impact	None recommended
Noise	Increase in noise duration	Noise duration remains at current levels	None recommended
Vegetation	Temporary removal of up to 25.75 acres of vegetation at any one time, changes in species composition, and potential weed infestations along roads	Temporary removal of up to 12 acres of vegetation at any one time, changes in species composition and potential weed infestations along roads	Minimized disturbance, prompt revegetation of all disturbed areas not required for operations with native species, attain revegetation success standards, weed control
	Reclamation unsuccessful after 5 years	Reclamation unsuccessful after 5 years	Further BLM approved reclamation efforts until successful reclamation is achieved
Wetlands	No impact	No impact	None recommended
Cryptogamic Crusts	Temporary but long-term crust removal on 41 acres	Temporary but long-term crust removal on 12 acres	Minimized disturbance, selective salvage and replacement of cryptogamic crusts and topsoil to serve as inoculant for crust reestablishment, store crust in long, low piles
Threatened and Endangered Plant Species	Loss of 253 Wright fishhook cactus	Loss of 116 Wright fishhook	In addition to transplanting cactus, cactus soil would be saved as would cactus seed. only native seed would be used in reclamation
	Potential loss of additional cactus	Potential loss of additional cactus	Restrict traffic to the mine area and the haul road, install signs restricting travel to existing roads
Big Game	Temporary loss of up to 25.75 acres of habitat	Temporary loss of up to 5 acres of habitat	None recommended
	Animal displacement from larger area around the mine	Animal displacement from larger area around the mine	None recommended
	Mortality due to additional traffic	Mortality due to vehicular collusion would continue at present rates	Adhere to speed limits, employee and contractor education
Raptors	Temporary loss of up to 25.75 acres of foraging habitat	Temporary loss of up to 5 acres of foraging habitat	None recommended
Wild Horses	Temporary loss of up to 25.75 acres of habitat and displacement from about 2,500 acres	Temporary loss of up to 5 acres of habitat and displacement from about 2,300 acres	Prompt revegetation of disturbed areas no longer needed for reclamation, successful reclamation
Threatened and Endangered	No impacts anticipated	No impacts anticipated	None recommended

Animal Species State Sensitive Species	Loss of up to 25.75 acres of foraging habitat	Loss of up to 5 acres of foraging habitat	None recommended
Cultural Resources	Loss or destruction of subsurface cultural sites	Loss or destruction of subsurface cultural sites	Cease activity in the vicinity of unanticipated discoveries
	Unauthorized collection or vandalism	Unauthorized collection or vandalism	Inform employees and contractors concerning federal laws about cultural resources
Livestock Grazing	Loss of up to 57 acres of forage area	Loss of up to 5 acres of forage area	None recommended
Recreation	Loss of recreational opportunities and quality of the recreational experience due to disturbance, visual intrusions, noise, dust, and traffic	Loss of recreational opportunities and quality of the recreational experience due to disturbance, visual intrusions, noise, dust, and traffic	None recommended
Wilderness Study Areas	No impact	No impact	None recommended
HR.1500 Lands	Long-term loss of potential for Congress to designate affected HR.1500 lands as wilderness	Long-term loss of potential for Congress to designated affected HR.1500 lands as wilderness	None recommended because HR.1500 lands are not afforded legal protection as WSAs and wilderness; final reclamation to restore restore potential for wilderness designation
Visual Resources	Loss of visual quality for recreational users	Loss of visual quality for recreational users	None recommended
Traffic	Increased traffic levels	Traffic levels remain at current levels	Implement dust suppression when dust plume a truck exceeds 200 feet as a safety measure

Map 1

T.24S., R.7E.

HR1500 Areas and Wilderness Study Areas